1. Product and Company Identification

Material name: Penta OL Technical Pentachlorophenol
Revision date: 08-26-2011
Version #: 01
CAS #: Mixture
Product use: Wood preservative.
Synonym(s): None.
Manufacturer/Supplier: KMG- Bernuth, Inc.
9555 W. Sam Houston Parkway S.
Suite 600
Houston, Texas 77099
Phone Number: 713-600-3800

Emergency CHEMTREC: 1-800-424-9300
Emergency medical treatment: 1-800-322-8177

2. Hazards Identification

Physical state: Solid.
Appearance: Crystals.
Emergency overview: DANGER
May be fatal if inhaled or absorbed through skin. Harmful if swallowed. Causes skin, eye and respiratory tract irritation. Can cause cardiovascular effects. May cause damage to the heart.

OSHA regulatory status: This product is considered hazardous under 29 CFR 1910.1200 (Hazard Communication).

Potential health effects

Routes of exposure
Eye contact. Skin contact. Inhalation. Ingestion.

Eyes
Causes eye irritation.

Skin
May be fatal if absorbed through skin. Causes skin irritation. Readily absorbed through the skin.

Inhalation
May be fatal if inhaled. Causes respiratory tract irritation.

Ingestion
Harmful if swallowed.

Target organs

Chronic effects
Possible cancer hazard - may cause cancer based on animal data. Human exposure to pentachlorophenol may result in the development of chloracne. Mild cases resemble other forms of acne or skin changes observed with aging. May cause blood damage. May cause central nervous system effects. May cause damage to the heart. May cause damage to the liver and kidneys. Pentachlorophenol has been determined to be embryo and fetotoxic to rats but not to hamsters. Pentachlorophenol has not been found to cause teratogenic effects (birth defects) in lab animals, but can cause delays in normal fetal development. EPA has expressed an opinion that pentachlorophenol may produce defects in the offspring of lab animals.

Signs and symptoms

Potential environmental effects
Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

3. Composition / Information on Ingredients

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS #</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pentachlorophenol</td>
<td>87-86-5</td>
<td>86</td>
</tr>
<tr>
<td>Other Chlorophenols</td>
<td>Mixture</td>
<td>10</td>
</tr>
<tr>
<td>Hexachlorobenzene</td>
<td>118-74-1</td>
<td>max 5.0 ppm</td>
</tr>
<tr>
<td>Hexachlorodibenzo-8-dioxin</td>
<td>34465-46-8</td>
<td>max 4.0 ppm</td>
</tr>
</tbody>
</table>
Composition comments
All concentrations are in percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

4. First Aid Measures

First aid procedures

Eye contact
Do not rub eye. Immediately flush with plenty of water for up to 15 minutes. Remove any contact lenses and open eyes wide apart. Get medical attention if irritation develops and persists.

Skin contact
In case of accidents: Call an ambulance immediately! Remove contaminated clothes and rinse skin thoroughly with water for at least 15 minutes.

Inhalation
Immediately remove from further exposure. Get immediate medical assistance. For those providing assistance, avoid exposure to yourself or others. Use adequate respiratory protection. Give supplemental oxygen, if available. If breathing has stopped, assist ventilation with a mechanical device or use mouth-to-mouth resuscitation.

Ingestion
Rinse mouth thoroughly with water and give large amounts of milk or water to people not unconscious. Only induce vomiting at the instruction of medical personnel. Get medical attention.

Notes to physician
In case of shortness of breath, give oxygen. Keep victim warm.

General advice
Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

5. Fire Fighting Measures

Flammable properties
The product is non-combustible.

Extinguishing media

Suitable extinguishing media
Use fire-extinguishing media appropriate for surrounding materials.

Unsuitable extinguishing media
None.

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

Fire fighting equipment/instructions
Selection of respiratory protection for fire fighting: follow the general fire precautions indicated in the workplace. Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

Specific methods
Use standard firefighting procedures and consider the hazards of other involved materials.

Hazardous combustion products

6. Accidental Release Measures

Personal precautions

Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not contaminate water.

Methods for containment
Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible.
Prevent entry into waterways, sewers, basements or confined areas.

Methods for cleaning up
Reduce airborne dust and prevent scattering by moistening with water.

Large Spills: Absorb in vermiculite, dry sand or earth and place into containers. Sweep up and place in a clearly labeled container for chemical waste. Containers with collected spillage must be properly labeled with correct contents and hazard symbol. Collect and dispose of spillage as indicated in section 13 of the MSDS.

Small Spills: Sweep or scoop up and remove. Collect in containers and seal securely.

Other information
Never return spills in original containers for re-use.

Clean up in accordance with all applicable regulations.
7. Handling and Storage

Handling  Exposure to pentachlorophenol during pregnancy should be avoided. Avoid dust formation. Local exhaust is recommended. Avoid any exposure. Wear appropriate personal protective equipment. Observe good industrial hygiene practices.

Storage  Store in closed original container in a dry place. Do not store near heat sources or expose to high temperatures. Keep container tightly closed. Keep in a well-ventilated place. Keep this material away from food, drink and animal feed. Store away from incompatible materials.

8. Exposure Controls / Personal Protection

Occupational exposure limits

<table>
<thead>
<tr>
<th>Type</th>
<th>Components</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>TWA</td>
<td>Pentachlorophenol</td>
<td>0.5 mg/m³</td>
</tr>
<tr>
<td>PEL</td>
<td>Pentachlorophenol</td>
<td>0.5 mg/m³</td>
</tr>
<tr>
<td>TWA</td>
<td>Pentachlorophenol</td>
<td>0.5 mg/m³</td>
</tr>
<tr>
<td>TWA</td>
<td>Pentachlorophenol</td>
<td>0.5 mg/m³</td>
</tr>
<tr>
<td>TWA</td>
<td>Pentachlorophenol</td>
<td>0.5 mg/m³</td>
</tr>
<tr>
<td>TWA</td>
<td>Pentachlorophenol</td>
<td>0.5 mg/m³</td>
</tr>
<tr>
<td>STEL</td>
<td>Pentachlorophenol</td>
<td>1.5 mg/m³</td>
</tr>
</tbody>
</table>

Exposure guidelines  No exposure standards allocated.

Engineering controls  Provide adequate ventilation. Observe Occupational Exposure Limits and minimize the risk of inhalation of dust.

Personal protective equipment

Eye / face protection  Wear approved safety goggles.

Skin protection  Wear protective gloves. Suitable gloves can be recommended by the glove supplier. Wear appropriate chemical resistant clothing to prevent any possibility of skin contact.

Respiratory protection  If engineering measures are not sufficient to maintain concentrations of dust particulates below the OEL, suitable respiratory protection must be worn. In the United States of America, if respirators are used, a program should be instituted to assure compliance with OSHA Standard 63 FR 1152, January 8, 1998. Use a NIOSH/MSHA approved air purifying respirator as needed to control exposure. Consult with respirator manufacturer to determine respirator selection, use, and limitations. Use positive pressure, air-supplied respirator for uncontrolled releases or when air purifying respirator limitations may be exceeded. Follow respirator protection program requirements (OSHA 1910.134 and ANSI Z88.2) for all respirator use.

General hygiene considerations  Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and immediately after handling the product. When using, do not eat, drink or smoke. Launder contaminated clothing before reuse. Remove and isolate contaminated clothing and shoes. Observe any medical surveillance requirements.
9. Physical & Chemical Properties

Appearance
Crystals.

Color
Brownish-grey.

Odor
Phenolic.

Odor threshold
Not available.

Physical state
Solid.

Form
Solid.

pH
Not applicable.

Melting point
374 °F (190 °C)

Freezing point
Not applicable.

Boiling point
590 °F (310 °C) (760 mm Hg)

Flash point
Non flammable.

Evaporation rate
Not applicable.

Flammability limits in air, upper, % by volume
Not applicable.

Flammability limits in air, lower, % by volume
Not applicable.

Vapor pressure
40 mm Hg (211.2°C)

Vapor density
9.2

Specific gravity
1.98 (Water = 1.0)

Solubility (water)
14 ppm (20°C)

Partition coefficient (n-octanol/water)
Not available.

Auto-ignition temperature
Not applicable.

Decomposition temperature
Not available.

Bulk density
123.6 lb/ft³ (20°)

Density
1.98

Percent volatile
No data available.

Molecular weight
266.32

Molecular formula
C₆Cl₅OH

10. Chemical Stability & Reactivity Information

Chemical stability
Stable under normal temperature conditions.

Conditions to avoid
Avoid dust formation. Elevated temperatures. Decomposes on heating above 200°C, producing toxic and corrosive fumes including dioxins.

Incompatible materials
Strong oxidizing agents.

Hazardous decomposition products

Possibility of hazardous reactions
Hazardous polymerization does not occur.

11. Toxicological Information

Toxicological data

<table>
<thead>
<tr>
<th>Components</th>
<th>Test Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pentachlorophenol (87-86-5)</td>
<td>Acute Dermal LD50 Rat: 96 mg/kg</td>
</tr>
<tr>
<td></td>
<td>Acute Inhalation LC50 Rat: 0.2 mg/l</td>
</tr>
<tr>
<td></td>
<td>Acute Oral LD50 Rat: 146 mg/kg</td>
</tr>
</tbody>
</table>

Acute effects
May be fatal if inhaled or absorbed through skin. Harmful if swallowed. Can cause cardiovascular effects. May cause damage to the heart.

Local effects
Causes skin, eye and respiratory tract irritation.
US ACGIH Threshold Limit Values: Skin designation
Pentachlorophenol (CAS 87-86-5) Can be absorbed through the skin.

Sensitization Not a skin sensitizer.

Chronic effects May cause blood damage. May cause central nervous system effects. May cause damage to the heart. May cause damage to the liver and kidneys.

Carcinogenicity Possible cancer hazard - may cause cancer based on animal data.

ACGIH Carcinogens
Pentachlorophenol (CAS 87-86-5) A3 Confirmed animal carcinogen with unknown relevance to humans.

IARC Monographs. Overall Evaluation of Carcinogenicity
Pentachlorophenol (CAS 87-86-5) 2B Possibly carcinogenic to humans.

Mutagenicity No data available.

Neurological effects No data available.

Reproductive effects Pentachlorophenol has not been found to cause teratogenic effects (birth defects) in lab animals, but can cause delays in normal fetal development. EPA has expressed an opinion that pentachlorophenol may produce defects in the offspring of lab animals.

Teratogenicity Pentachlorophenol has been determined to be embryo and fetotoxic to rats but not to hamsters.

Symptoms and target organs
The usual symptoms of chloracne are the formation of blackheads, whiteheads and yellow cysts over the temples and around the ears. Symptoms reverse upon removal of exposure source.

Further information Human exposure to pentachlorophenol may result in the development of chloracne. Mild cases resemble other forms of acne or skin changes observed with aging.
The registrant has complied with all terms and conditions of the registration governing the composition of this product as approved by the United State Environmental Protection Agency under section 3 of the Federal Insecticide, Fungicide, and Rodenticide Act. The use of this product for any purpose other than those stated on the label, including use of this product in the manufacture or formulation of other pesticide products or in repackaging of the product, is prohibited.

12. Ecological Information

Ecotoxicological data Components Test Results

<table>
<thead>
<tr>
<th>Pentachlorophenol (87-86-5)</th>
<th>EC50 Water flea (Daphnia magna): 0.08 mg/l 48 hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>LC50 Zebra danio (Danio rerio): 0.0004 - 0.0005 mg/l 96 hours</td>
</tr>
</tbody>
</table>

Ecotoxicity Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
Persistence and degradability No data available.
Bioaccumulation / Accumulation No data available.
Partition coefficient (n-octanol/water) Not available.
Mobility in environmental media The product is insoluble in water.

13. Disposal Considerations

Waste codes D037: Waste Pentachlorophenol
Disposal instructions Dispose of this material and its container at hazardous or special waste collection point. Do not incinerate sealed containers. Do not allow this material to drain into sewers/water supplies. Dispose in accordance with all applicable regulations.
Waste from residues / unused products Dispose of in accordance with local regulations.
Contaminated packaging Empty containers should be taken to an approved waste handling site for recycling or disposal.
14. Transport Information

DOT

Basic shipping requirements:
- UN number: UN3155
- Proper shipping name: Pentachlorophenol
- Hazard class: 6.1
- Packing group: II
- Environmental hazards:
  - Marine pollutant: Yes
  - Labels required: 6.1
- Additional information:
  - Special provisions: IB8, IP2, IP4, T3, TP33
  - Packaging exceptions: None
  - Packaging non bulk: 212
  - Packaging bulk: 242
  - ERG number: 154

IATA

Basic shipping requirements:
- UN number: 3155
- Proper shipping name: Pentachlorophenol
- Hazard class: 6.1
- Packing group: II
- Environmental hazards:
  - Marine pollutant: Yes
- Additional information:
  - ERG code: 6L

IMDG

Basic shipping requirements:
- UN number: 3155
- Proper shipping name: PENTACHLOROPHENOL
- Hazard class: 6.1
- Packing group: II
- Environmental hazards:
  - Marine pollutant: Yes
- EmS No.: F-A, S-A

TDG

Basic shipping requirements:
- Proper shipping name: PENTACHLOROPHENOL
- Hazard class: 6.1
- UN number: UN3155
- Packing group: II
- Marine pollutant: Yes

General
Read safety instructions, MSDS and emergency procedures before handling.

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.

US CAA Section 112 Hazardous Air Pollutants (HAPs) List
PENTACHLOROPHENOL (CAS 87-86-5)

US EPCRA (SARA Title III) Section 313 - Toxic Chemical: De minimis concentration
- Pentachlorophenol (CAS 87-86-5) 0.1 %

US EPCRA (SARA Title III) Section 313 - Toxic Chemical: Listed substance
- Pentachlorophenol (CAS 87-86-5) Listed.
**CERCLA (Superfund) reportable quantity (lbs) (40 CFR 302.4)**

Pentachlorophenol: 10

**Superfund Amendments and Reauthorization Act of 1986 (SARA)**

<table>
<thead>
<tr>
<th>Hazard categories</th>
<th>Immediate Hazard - Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Delayed Hazard - Yes</td>
</tr>
<tr>
<td></td>
<td>Fire Hazard - No</td>
</tr>
<tr>
<td></td>
<td>Pressure Hazard - No</td>
</tr>
<tr>
<td></td>
<td>Reactivity Hazard - No</td>
</tr>
</tbody>
</table>

**Section 302 extremely hazardous substance (40 CFR 355, Appendix A)**

No

**Section 311/312 (40 CFR 370)**

Yes

**Drug Enforcement Administration (DEA) (21 CFR 1308.11-15)**

Not controlled

**Canadian regulations**

This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

**WHMIS status**

Controlled

**WHMIS classification**

D1A - Immediate/Serious-VERY TOXIC

D2A - Other Toxic Effects-VERY TOXIC

D2B - Other Toxic Effects-TOXIC

**WHMIS labeling**

**Inventory status**

<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>No</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>No</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>No</td>
</tr>
<tr>
<td>Korea</td>
<td>Existing Chemicals List (ECL)</td>
<td>No</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>No</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)

**State regulations**

**WARNING:** This product contains a chemical known to the State of California to cause cancer.

**US - California Hazardous Substances (Director's): Listed substance**

Pentachlorophenol (CAS 87-86-5) Listed.

**US - California Proposition 65 - Carcinogens & Reproductive Toxicity (CRT): Listed substance**

Pentachlorophenol (CAS 87-86-5) Listed.

**US - California Proposition 65 - CRT: Listed date/Carcinogenic substance**

Pentachlorophenol (CAS 87-86-5) Listed: January 1, 1990 Carcinogenic.

**US - Massachusetts RTK - Substance: Listed substance**

Pentachlorophenol (CAS 87-86-5) Listed.

**US - New Jersey Community RTK (EHS Survey): Reportable threshold**

Pentachlorophenol (CAS 87-86-5) 500 LBS

**US - New Jersey RTK - Substances: Listed substance**

Pentachlorophenol (CAS 87-86-5) Listed.
US - Pennsylvania RTK - Hazardous Substances: Listed substance
Pentachlorophenol (CAS 87-86-5) Listed.

US - Pennsylvania RTK - Hazardous Substances: Special hazard
Pentachlorophenol (CAS 87-86-5) Special hazard.

Mexico regulations
This safety data sheet was prepared in accordance with the Official Mexican Standard (NOM-018-STPS-2000).

16. Other Information

Further information
HMIS® is a registered trade and service mark of the NPCA.
J - Goggles, Gloves, Apron, Dust, Vapor Respirator

HMIS® ratings
Health: 3*
Flammability: 0
Physical hazard: 0
Personal protection: J

NFPA ratings
Health: 3
Flammability: 0
Instability: 0

Disclaimer
NOTICE: The information presented herein is based on data considered to be accurate as of the date of preparation of this Safety Data Sheet (SDS) and was prepared pursuant to Government regulation(s) that identify specific types of information to be provided. This SDS may not be used as a commercial specification sheet of manufacturer or seller, and no warranty or representation, expressed or implied, is made as to the accuracy or comprehensiveness of the foregoing data and safety information, nor is any authorization given or implied to practice any patented invention without a license. Additional information may be needed to evaluate other uses of the product, including use of the product in combination with any materials or in any processes other than those specifically referenced. Information provided herein with respect to any hazards that may be associated with the product is not meant to suggest that use of the product in a given application will necessarily result in any exposure or risk to workers or the general public. No responsibility can be assumed by vendor for any damage or injury resulting from abnormal use, from any failure to adhere to recommended practices, or from any hazards inherent in the nature of the product. Purchasers and users assume all risk of use, storage and handling of the product in compliance with applicable federal, state and local laws and regulations. Purchasers and users of the product specifically should advise all of their employees, agents, contractors and customers who will use the product of this (M)SDS.

Issue date
08-26-2011