SAFETY DATA SHEET

1. Identification

Product identifier: DACTHAL® FLOWABLE HERBICIDE

Other means of identification
- SDS number: 298
- Product registration number: 5481-487

Recommended use: Herbicide.

Recommended restrictions: No other uses are advised. Keep out of the Reach of Children!

EPA Registration number: EPA: 5481-487

Manufacturer/Importer/Supplier/Distributor information

Manufacturer
- Company name: AMVAC Chemical Corporation
- Address: 4685 MacArthur Court, Suite 1200, Newport Beach, CA 92660
- Telephone: AMVAC Chemical Corp 949-260-1200, AMVAC Chemical Corp 949-260-6270 (FAX)
- Website: www.Amvac-Chemical.com
- E-mail: CustServ@Amvac-Chemical.com

Emergency phone number
- Medical: 888-681-4261
- CHEMTREC®: 800-424-9300 (USA+Canada), 888-462-6822 (Product Use), +1-703-527-3887 (Outside USA)

2. Hazard(s) identification

Physical hazards: Not classified.

Health hazards:
- Acute toxicity, inhalation: Category 4
- Serious eye damage/eye irritation: Category 2B

Environmental hazards: Hazardous to the aquatic environment, acute hazard: Category 3

OSHA defined hazards: Not classified.

Label elements

Signal word: Warning

Hazard statement:
- Harmful if inhaled.
- Causes eye irritation.
- Harmful to aquatic life.

Precautionary statement
- Prevention:
  - Avoid breathing dust/fume.
  - Wear eye/face protection.
  - Wash hands thoroughly after handling.
  - Avoid release to the environment.
Response

IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or doctor/physician if you feel unwell. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.

Storage

Store away from incompatible materials.

Disposal

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

Hazard(s) not otherwise classified (HNOC)

None known.

Supplemental information

This is a pesticide product registered by the United States Environmental Protection Agency and is subject to certain labeling requirements under federal pesticide law. These requirements differ from the classification criteria and hazard information required for safety data sheets (SDS), and for workplace labels of non-pesticide chemicals. The hazard information required on the pesticide label is reproduced in section 15. The pesticide label also includes other important information, including directions for use.

3. Composition/information on ingredients

Mixtures

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>Common name and synonyms</th>
<th>CAS number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chlorthal-dimethyl</td>
<td>2,3,5,6-Tetrachloro-1,4-benzenedicarboxylic acid, Dimethyl ester</td>
<td>1861-32-1</td>
<td>54.9</td>
</tr>
<tr>
<td>Hi Sil 233</td>
<td></td>
<td>112926-00-8</td>
<td>0.75</td>
</tr>
</tbody>
</table>

4. First-aid measures

Inhalation

Remove victim to fresh air and keep at rest in a position comfortable for breathing. Provide oxygen or artificial respiration if needed, preferably mouth to mouth if possible. Do not use mouth-to-mouth method if victim inhaled the substance. Induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Get medical attention if symptoms occur.

Skin contact

Take off contaminated clothing and wash before reuse. Rinse with water. Get medical attention if irritation develops and persists.

Eye contact

Rinse with water about 15-20 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention if irritation develops and persists.

Ingestion

Rinse mouth. Do not induce vomiting without advice from poison control center. Never give anything by mouth to a victim who is unconscious or is having convulsions. Get medical attention if symptoms occur.

Most important symptoms/effects, acute and delayed

Causes eye irritation. May cause redness and pain.

Indication of immediate medical attention and special treatment needed

Provide general supportive measures and treat symptomatically. In case of shortness of breath, give oxygen.

General information

Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. In the case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

5. Fire-fighting measures

Suitable extinguishing media

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

Unsuitable extinguishing media

None known.

Specific hazards arising from the chemical

During fire, gases hazardous to health may be formed. Hydrogen chloride, carbon oxides and unidentified organic compounds may be formed when it is heated excessively or burned.

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

In the event of fire, cool tanks with water spray. Water runoff can cause environmental damage.

Specific methods

In the event of fire and/or explosion do not breathe fumes. Cool containers exposed to flames with water until well after the fire is out.
No unusual fire or explosion hazards noted. This is a noncombustible solid that will burn or decompose when kept directly in the flame (NFPA rating = 1).

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures
Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Keep out of low areas. Wear appropriate personal protective equipment. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ventilate closed spaces before entering them. Local authorities should be advised if significant spillages cannot be contained. For personal protection, see section 8 of the SDS/SDS.

Methods and materials for containment and cleaning up
Stop the flow of material, if this is without risk, to prevent entry into waterways, sewer, basements or confined areas. Collect spillage. Prevent entry into waterways, sewer, basements or confined areas. Following product recovery, flush area with water.

Environmental precautions
Avoid release to the environment. Contact local authorities in case of spillage to drain/aquatic environment. Prevent further leakage or spillage if safe to do so. Do not contaminate water. Avoid discharge into drains, water courses or onto the ground.

7. Handling and storage

Precautions for safe handling
Keep out of the reach of children. Minimize dust generation and accumulation. Avoid contact with eyes. Avoid breathing dust. Wear appropriate personal protective equipment recommended in section 8. Wash thoroughly after handling. Observe good industrial hygiene practices. Do not empty into drains. Avoid release to the environment.

Conditions for safe storage, including any incompatibilities
Keep out of the reach of children. Keep container tightly closed. Store in a cool, dry place out of direct sunlight.

8. Exposure controls/personal protection

Occupational exposure limits

<table>
<thead>
<tr>
<th>US. OSHA Table Z-3 (29 CFR 1910.1000) Components</th>
<th>Type</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hi Sil 233 (CAS 112926-00-8)</td>
<td>TWA</td>
<td>0.8 mg/m³</td>
</tr>
<tr>
<td></td>
<td></td>
<td>20 mppcf</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>US. ACGIH Threshold Limit Values Additional components</th>
<th>Type</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hexachlorobenzene (CAS 118-74-1)</td>
<td>TWA</td>
<td>0.002 mg/m³</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>US. NIOSH: Pocket Guide to Chemical Hazards Components</th>
<th>Type</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hi Sil 233 (CAS 112926-00-8)</td>
<td>TWA</td>
<td>6 mg/m³</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>US. Workplace Environmental Exposure Level (WEEL) Guides Components</th>
<th>Type</th>
<th>Value</th>
<th>Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>TRADE SECRET</td>
<td>TWA</td>
<td>10 mg/m³</td>
<td>Aerosol</td>
</tr>
</tbody>
</table>

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

Exposure guidelines
Dust exposure limit.

US - California OELs: Skin designation
Hexachlorobenzene (CAS 118-74-1) Can be absorbed through the skin.

US - Minnesota Haz Subs: Skin designation applies
Hexachlorobenzene (CAS 118-74-1) Skin designation applies.

US ACGIH Threshold Limit Values: Skin designation
Hexachlorobenzene (CAS 118-74-1) 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 chemical resistant gloves (preferably nitrile)
  Other  Wear suitable protective clothing.
Respiratory protection  In case of insufficient ventilation, wear suitable respiratory equipment. Chemical respirator with organic vapor cartridge, full facepiece, dust and mist filter.
  Thermal hazards  Not applicable.
General hygiene considerations  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  Gray opaque viscous liquid suspension
Physical state  Liquid.
Form  Liquid suspension.
Color  Gray opaque
Odor  Slightly aromatic odor
Odor threshold  Not available
pH  6.5 - 8.5
Melting point/freezing point  23 °F (-5 °C)
Initial boiling point and boiling range  > 212 °F (> 100 °C)
Flash point  Not available.
Evaporation rate  Not determined
Flammability (solid, gas)
  Upper/lower flammability or explosive limits
    Explosive limit - lower (%)  Not available.
    Explosive limit - upper (%)  Not available.
Vapor pressure  2.10E-01 mPa (2.5 x 10^-6 torr) @ 25°C (gas saturation method)
Vapor density  Heavier than air
Relative density  Not available.
Solubility(ies)
  Solubility (water)  Disperses
  Solubility (solvents)  The active ingredient in this product is soluble in aromatic hydrocarbons, chlorinated hydrocarbons, ketones, and esters.
Auto-ignition temperature  Not available.
Decomposition temperature  Not available.
Viscosity  Not available.
Other information
  Bulk density  11 lb/gal @ 20°C
  Percent volatile  38.37 % estimated
  Specific gravity  1.32 @ 20°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. It will decompose at elevated temperatures (360-370°C).
Possibility of hazardous reactions  No dangerous reaction known under conditions of normal use.
Conditions to avoid  Contact with incompatible materials.
Incompatible materials  Strong oxidizing agents. Strong acids. Strong bases. Strong acids and bases will decompose the ester functions of DACTHAL®.
This product may emit hazardous fumes of hydrogen chloride, carbon oxides, and unidentified organic compounds when it is heated excessively or burned. WEAR SELF-CONTAINED BREATHING APPARATUS when these conditions are present. It will decompose at elevated temperatures (360-370°C).

11. Toxicological information

Information on likely routes of exposure

**Inhalation**
Harmful if inhaled.

**Skin contact**
Slight skin irritant.

**Eye contact**
Causes mild eye irritation.

**Ingestion**
Expected to be a low ingestion hazard.

Symptoms related to the physical, chemical and toxicological characteristics

Irritation of eyes. Exposure may cause temporary irritation, redness, or discomfort.

Information on toxicological effects

**Acute toxicity**

<table>
<thead>
<tr>
<th>Product</th>
<th>Species</th>
<th>Test Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dacthal Flowable</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Acute</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>dermal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LD50</td>
<td>rabbit</td>
<td>&gt; 5000 mg/kg</td>
</tr>
<tr>
<td>oral</td>
<td>rat</td>
<td>&gt; 5000 mg/kg</td>
</tr>
</tbody>
</table>

**Skin corrosion/irritation**
May be irritating to the skin.

**Serious eye damage/eye irritation**
Slight irritant.

**Respiratory or skin sensitization**

<table>
<thead>
<tr>
<th>Sensitization</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Respiratory sensitization</td>
<td>Not available.</td>
</tr>
<tr>
<td>Skin sensitization</td>
<td>Not sensitizing.</td>
</tr>
</tbody>
</table>

**Germ cell mutagenicity**
No evidence of mutagenicity has been observed in animal testing.

**Carcinogenicity**

None of the components present in this material at concentrations equal to or greater than 0.1% are listed by IARC, NTP, or OSHA, as a carcinogen. Chlorthal-Dimethyl has been classified by EPA as a Group C, possible human carcinogen.

**IARC Monographs. Overall Evaluation of Carcinogenicity**

Hexachlorobenzene (CAS 118-74-1) 2B Possibly carcinogenic to humans.

Hi Sil 233 (CAS 112926-00-8) 3 Not classifiable as to carcinogenicity to humans.

Not regulated.

**US. National Toxicology Program (NTP) Report on Carcinogens**
Hexachlorobenzene (CAS 118-74-1) Reasonably Anticipated to be a Human Carcinogen.

**Reproductive toxicity**
No effects on reproductive performance, only decreased pup and parental body weights, were seen throughout two successive generations in the rat when treated with Dacthal Technical.

**Specific target organ toxicity - single exposure**
Not available.

**Specific target organ toxicity - repeated exposure**
Not available.

**Aspiration hazard**
Not an aspiration hazard.

12. Ecological information

**Ecotoxicity**

<table>
<thead>
<tr>
<th>Components</th>
<th>Species</th>
<th>Test Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chlorthal-dimethyl</td>
<td>Water flea (Daphnia magna)</td>
<td>20 - 35 mg/l, 48 hours</td>
</tr>
</tbody>
</table>

Material name: DACTHAL® FLOWABLE HERBICIDE

Version #: 2.0  Revision date: Aug-29-2018  Issue date: May-11-2015
**Components Test Results**

<table>
<thead>
<tr>
<th>Species</th>
<th>Test Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fish</td>
<td>LC50</td>
</tr>
<tr>
<td>Species</td>
<td>Bluegill (Lepomis macrochirus)</td>
</tr>
</tbody>
</table>

**Persistence and degradability**
Not available.

**Bioaccumulative potential**
Not available.

**Partition coefficient n-octanol / water (log Kow)**
Chlorthal-dimethyl 4.28

**Mobility in soil**
Not available.

**Other adverse effects**
Not available.

**13. Disposal considerations**

**Disposal instructions**
Collect and reclaim or dispose in sealed containers at licensed waste disposal site according to all applicable regulations. This material and its container must be disposed of as hazardous waste. 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 all applicable local/regional/national/international regulations.

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

**Waste from residues / unused products**
Dispose of in accordance with all applicable 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 methods/information).

**Contaminated packaging**
Empty containers should be taken to an approved waste handling site for recycling or disposal according to all applicable regulations. Since emptied containers may retain product residue, follow label warnings even after container is emptied.

**14. Transport information**

**DOT**
Not regulated as dangerous goods.

**IATA**
Not regulated as dangerous goods.

Read safety instructions, SDS and emergency procedures before handling.

**IMDG**
Not regulated as dangerous goods.

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

**15. Regulatory information**

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

This product is registered under EPA/FIFRA Regulations. It is a violation of Federal Law to use this product in any manner inconsistent with its labeling. Read and follow all label directions. This product is excluded from listing requirements under EPA/TSCA.

HAZARD TO HUMANS AND DOMESTIC ANIMALS.

CAUTION! Causes moderate eye irritation. Avoid contact with eyes, skin, or clothing. Wash thoroughly with soap and water after handling.

ENVIRONMENTAL HAZARDS

Do not apply directly to water, or to areas where surface water is present (except for application to cranberry bogs) or to intertidal areas below the mean high water mark. Do not allow this material to drift onto neighboring crops or non crop areas or use in a manner or at a time other than in accordance with label directions because animal, plant or crop injury, illegal residues, or other undesirable results may occur.

**TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)**
Not regulated.
CERCLA Hazardous Substance List (40 CFR 302.4)
Hexachlorobenzene (CAS 118-74-1) Listed.

SARA 304 Emergency release notification
Not regulated.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1052)
Not regulated.

Superfund Amendments and Reauthorization Act of 1986 (SARA)
SARA 302 Extremely hazardous substance
Not listed.

SARA 311/312 Hazardous chemical
Yes

Classified hazard categories
Acute toxicity (any route of exposure)
Serious eye damage or eye irritation

SARA 313 (TRI reporting)

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>CAS number</th>
<th>% by wt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hexachlorobenzene</td>
<td>118-74-1</td>
<td>&lt;10 ppm</td>
</tr>
</tbody>
</table>

Other federal regulations
Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List
Hexachlorobenzene (CAS 118-74-1)
Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)
Not regulated.

Safe Drinking Water Act (SDWA)
Not regulated.

US state regulations
California Proposition 65
WARNING: This product can expose you to Hexachlorobenzene, 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
Hexachlorobenzene (CAS 118-74-1) Listed: October 1, 1987

California Proposition 65 - CRT: Listed date/Developmental toxin
Hexachlorobenzene (CAS 118-74-1) Listed: January 1, 1989

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>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>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>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
May-11-2015

Revision date
Aug-29-2018
References

ACGIH
EPA: AQUIRE database
NLM: Hazardous Substances Data Base
US. IARC Monographs on Occupational Exposures to Chemical Agents
ACGIH®: American Conference of Governmental Industrial Hygienists
CERCLA: Comprehensive Environmental Response, Compensation, and Liability Act
EPA: Environmental Protection Agency
FIFRA: Federal Insecticide, Fungicide, and Rodenticide Act
IARC: International Agency for Research on Cancer
NTP: National Toxicology Program
OSHA: Occupational Safety and Health Agency
SARA: Superfund Amendments and Reauthorization Act
TSCA: Toxic Substances Control Act
DOT: Department of Transportation
IMDG: International Maritime Dangerous Goods
IATA: International Air Transport Association

Version #

2.0

Further information

Dacthal is a registered Trademark of Amvac Chemical Corporation.

HMIS® ratings

Health: 2
Flammability: 0
Physical hazard: 0

NFPA ratings

Health: 2
Flammability: 0
Instability: 0

Disclaimer

This information is provided for the limited guidance to the user. While AMVAC believes that the information is, as of the date hereof, reliable, it is the user’s responsibility to determine the suitability of the information for its purposes. The user is advised not to construe the information as absolutely complete since additional information may be necessary or desirable when particular, exceptional, or variable conditions or circumstances exist (like combinations with other materials), or because of applicable regulations. No express or implied warranty of merchantability or fitness for a particular purpose or otherwise is made hereunder with respect to the information or the product to which the information relates.

AMVAC Chemical Corporation 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.

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Revision information

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