1. Identification

Product identifier  
Diroban

Other means of identification

Synonyms  
Melarsomine dihydrochloride * Organic arsenic

Recommended use  
Veterinary anti-worm agent (anthelmintic)

Recommended restrictions  
Not for human use

Manufacturer/Importer/Supplier/Distributor information

Company Name (US)  
Zoetis Inc.
10 Sylvan Way
Parsippany, New Jersey 07054 (USA)

Rocky Mountain Poison and Drug Center  
1-866-531-8896

Product Support/Technical Services  
1-800-366-5288

Emergency telephone numbers  
CHEMTREC (24 hours): 1-800-424-9300

Contact E-Mail  
VMIPSrecords@zoetis.com

Company Name (EU)  
Zoetis Belgium S.A.
Mercuriusstraat 20
1930 Zaventem
Belgium

Emergency telephone number  
International CHEMTREC (24 hours): +1-703-527-3887

Contact E-Mail  
VMIPSrecords@zoetis.com

2. Hazard(s) identification

Physical hazards  
Not classified.

Health hazards

Acute toxicity, oral  
Category 4

Acute toxicity, inhalation  
Category 4

Serious eye damage/eye irritation  
Category 2A

Environmental hazards

Hazardous to the aquatic environment, acute hazard  
Category 2

Hazardous to the aquatic environment, long-term hazard  
Category 2

OSHA defined hazards

Not classified.

Label elements

Signal word  
Warning

Hazard statement  
Harmful if swallowed. Causes serious eye irritation. Harmful if inhaled. Toxic to aquatic life with long lasting effects.

Precautionary statement

Prevention  
Avoid breathing dust. Wash thoroughly after handling. Do not eat, drink or smoke when using this product. Use only outdoors or in a well-ventilated area. Avoid release to the environment. Wear eye protection/face protection.
Response
If swallowed: Call a poison center/doctor if you feel unwell. Rinse mouth. Inhaled: Remove person to fresh air and keep 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. Collect spillage.

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
Accidental or incidental ingestion of large amounts may cause nausea, abdominal discomfort, headache or dizziness. Excessive inhalation of dust/mist/vapor may cause coughing, respiratory distress, numbness and tingling of the extremities, and/or muscle cramping.

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>Glycine</td>
<td>56-40-6</td>
<td>33.75 mg</td>
<td></td>
</tr>
<tr>
<td>Melarsomine dihydrochloride</td>
<td>128470-15-5</td>
<td>50 mg</td>
<td></td>
</tr>
</tbody>
</table>

4. First-aid measures

Inhalation
Remove victim to fresh air and keep at rest in a position comfortable for breathing. If breathing is difficult, give oxygen. Call a physician if symptoms develop or persist. Call a POISON CENTER or doctor/physician if you feel unwell.

Skin contact
Wash off with soap and water. Get medical attention if irritation develops and persists.

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. Get medical attention if irritation develops and persists.

Ingestion
Rinse mouth. Call a physician or poison control center immediately. 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.

Most important symptoms/effects, acute and delayed
Severe eye irritation. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Ingestion may result in mild gastrointestinal irritation with nausea, vomiting, or diarrhea. Inhalation of dust may cause shortness of breath, tightness of the chest, a sore throat and cough.

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.

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. May emit toxic fumes of oxides of carbon and nitrogen. Arsenic. May include hydrogen chloride.

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
Ensure adequate ventilation. Avoid the generation of dusts during clean-up. Wear appropriate protective equipment and clothing during clean-up. Keep unnecessary personnel away. Avoid inhalation of dust. Ventilate the contaminated area. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Local authorities should be advised if significant spillages cannot be contained. For personal protection, see section 8 of the SDS.
Ensure adequate ventilation. Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Wear appropriate protective equipment and clothing during clean-up. Avoid dispersal of dust in the air (i.e., clearing dust surfaces with compressed air). Prevent product from entering drains. Prevent entry into waterways, sewer, basements or confined areas. Stop the flow of material, if this is without risk.

Large Spills: Absorb in vermiculite, dry sand or earth and place into containers. Clean surface thoroughly to remove residual contamination.

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. 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.

Use only with adequate ventilation. Avoid dust formation. Wear personal protective equipment. Avoid contact with eyes, skin, and clothing. Avoid breathing dust/fume/gas/mist/vapors/spray. Avoid accidental injection. Do not taste or swallow. Avoid prolonged exposure. Observe good industrial hygiene practices. When using, do not eat, drink or smoke. Wash hands thoroughly after handling. Keep away from open flames, hot surfaces and sources of ignition. Avoid release to the environment.

Keep locked up. Keep tightly closed in a dry, cool and well-ventilated place. ≤ 30°C/86°F. Do not handle or store near an open flame, heat or other sources of ignition. Do not store in direct sunlight. Keep away from food, drink and animal feedingstuffs. Store away from incompatible materials (see Section 10 of the SDS). Keep out of the reach of children.

This mixture has no ingredients that have PEL, TLV, or other recommended exposure limit. No biological exposure limits noted for the ingredient(s).

Melarsomine dihydrochloride: Zoetis OEB 3 - Contact Hazards Unknown (control exposure to the range of 10ug/m3 to < 100ug/m3)

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. General room ventilation is adequate unless the process generates dust, mist or aerosols.

Wear safety glasses with side shields (or goggles).

Wear appropriate chemical resistant gloves.

Wear suitable protective clothing. Use protective clothing (uniforms, lab coats, disposable coveralls, etc.) in both production and laboratory areas.

In case of insufficient ventilation, wear suitable respiratory equipment. Whenever excessive air contamination (dust, mist, vapor) is generated, respiratory protection, with appropriate protection factors, should be used to minimize exposure. Chemical respirator with organic vapor cartridge, full facepiece, dust and mist filter.

Not applicable.

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.

Freeze-dried powder

Solid.

Solid.

Not available.

Not available.

Material name: Diroban

1318 Version #: 01 Issue date: 12-14-2016

SDS US 3 / 8
pH: Not available.
Melting point/freezing point: 422.6 °F (217 °C) estimated
Initial boiling point and boiling range: Not available.
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: Not available.
Vapor density: Not available.
Relative density: Not available.
Solubility(ies):
- Solubility (water): Not available.
Partition coefficient (n-octanol/water): Not available.
Auto-ignition temperature: Not available.
Decomposition temperature: Not available.
Viscosity: Not available.
Other information:
- Explosive properties: Not explosive.
- Oxidizing properties: Not oxidizing.

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. Sunlight. Keep away from heat, spark, open flames and other sources of ignition. Avoid dispersion as a dust cloud.
Incompatible materials: Strong oxidizing agents.
Hazardous decomposition products: Irritating and/or toxic fumes and gases may be emitted upon the product's decomposition. May include hydrogen chloride. Arsenic. Carbon oxides. Nitrogen oxides (NOx).

11. Toxicological information
Information on likely routes of exposure:
- Inhalation: Harmful if inhaled.
- Skin contact: Prolonged skin contact may cause temporary irritation.
- Eye contact: Causes serious eye irritation. Melarsomine dihydrochloride Severity: Irritant
- Ingestion: Harmful if swallowed.
Symptoms related to the physical, chemical and toxicological characteristics:
Severe eye irritation. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Ingestion may result in mild gastrointestinal irritation with nausea, vomiting, or diarrhea. Inhalation of dust may cause shortness of breath, tightness of the chest, a sore throat and cough.

Information on toxicological effects:
Acute toxicity: Harmful if inhaled. Harmful if swallowed.
### Test Results

<table>
<thead>
<tr>
<th>Product</th>
<th>Species</th>
<th>Test Results</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Diroban</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Acute</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Inhalation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LC50</td>
<td></td>
<td>2.5 mg/kg (Calculated ATE)</td>
</tr>
<tr>
<td><strong>Oral</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LD50</td>
<td>Rat</td>
<td>588 mg/kg (Calculated ATE)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Components</strong></th>
<th><strong>Species</strong></th>
<th><strong>Test Results</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Melarsomine dihydrochloride (CAS 128470-15-5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Acute</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Inhalation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LC50</td>
<td></td>
<td>&lt; 5 mg/L Estimated</td>
</tr>
<tr>
<td><strong>Intravenous</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LD50</td>
<td>Mouse</td>
<td>59 mg/kg</td>
</tr>
<tr>
<td></td>
<td>Rat</td>
<td>22 mg/kg</td>
</tr>
<tr>
<td><strong>Oral</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LD50</td>
<td>Mouse</td>
<td>596 mg/kg</td>
</tr>
<tr>
<td></td>
<td>Rat</td>
<td>353 mg/kg</td>
</tr>
</tbody>
</table>

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

**Serious eye damage/eye irritation**: Causes serious eye irritation.

**Eye Contact**
- Melarsomine dihydrochloride
  - Severity: Irritant

**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**
- This product is not considered to be a carcinogen by IARC, ACGIH, NTP, or OSHA.

- Not regulated.

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

**Reproductive toxicity**
- This product is not expected to cause reproductive or developmental effects.

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

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

**Aspiration hazard**
- Not an aspiration hazard.

**Further information**
- Accidental or incidental ingestion of large amounts may cause nausea, abdominal discomfort, headache or dizziness. Excessive inhalation of dust/mist/vapor may cause coughing, respiratory distress, numbness and tingling of the extremities, and/or muscle cramping.

### Ecological information

**Ecotoxicity**
- Toxic to aquatic life with long lasting effects. Avoid release to the environment.

<table>
<thead>
<tr>
<th>Components</th>
<th>Species</th>
<th>Test Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Melarsomine dihydrochloride (CAS 128470-15-5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Acute</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LC50</td>
<td>Pimephales promelas (Fathead Minnow)</td>
<td>&gt; 10 mg/l, 48 Hours (Effluent)</td>
</tr>
</tbody>
</table>
Components Test Results

Species
Aquatic Crustacea LC50 Daphnia pulex 2.155 mg/L, 48 Hours (Effluent)

Persistence and degradability
No data is available on the degradability of this product.

Bioaccumulative potential
No data available.

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
Waste of this product may qualify as a RCRA Hazardous Waste. Status should be confirmed by testing for RCRA hazardous characteristics (i.e. corrosivity, toxicity, reactivity, or ignitability). Avoid release to the environment. Do not allow this material to drain into sewers/water supplies. Do not contaminate ponds, waterways or ditches with chemical or used container. Considering the relevant known environmental and human health hazards of the material, review and implement appropriate technical and procedural waste water and waste disposal measures to prevent occupational exposure and environmental release. It is recommended that waste minimization be practiced. The best available technology should be utilized to prevent environmental releases. This may include destructive techniques for waste and wastewater. 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
D004: Waste Arsenic
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 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
Not regulated as dangerous goods.

IATA
UN number UN3077
UN proper shipping name Environmentally Hazardous Substance, Solid, n.o.s (Melarsomine dihydrochloride)
Transport hazard class(es) Class 9
Subsidiary risk -
Packing group III
Environmental hazards No.
Special precautions for user Read safety instructions, SDS and emergency procedures before handling.

IMDG
UN number UN3077
UN proper shipping name Environmentally Hazardous Substance, Solid, n.o.s (Melarsomine dihydrochloride), MARINE POLLUTANT (Melarsomine dihydrochloride)
Transport hazard class(es) Class 9
Subsidiary risk -
Packing group III
Environmental hazards Yes
Marine pollutant
EmS Not available.
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 Not applicable.
IMDG Regulated Marine Pollutant. As of January 1, 2015, materials offered for transport that are classified for transportation only as Marine Pollutants and which are packaged in single or combination packagings containing a net quantity per single or inner packaging of 5 Liters or less for liquids or having a net mass per single or inner packaging of 5 kilograms or less for solids are NOT subject to ICAO/IATA, IMDG, or ADR transport regulations provided the general packaging requirements of those regulations are met. Refer to ICAO/IATA A197, IMDG 2.10.2.7, ADR SP 375. Please refer to the applicable dangerous goods regulations for additional information. Transport according to the requirements of the appropriate regulatory body.

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)**

Not listed.

**SARA 304 Emergency release notification**

Not regulated.


Not regulated.

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

<table>
<thead>
<tr>
<th>Hazard categories</th>
<th>SARA 302 Extremely hazardous substance</th>
<th>SARA 311/312 Hazardous chemical</th>
<th>SARA 313 (TRI reporting)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Immediate Hazard</td>
<td>Yes</td>
<td>No</td>
<td>Not regulated.</td>
</tr>
<tr>
<td>Delayed Hazard</td>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fire Hazard</td>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pressure Hazard</td>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reactivity Hazard</td>
<td>No</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Other federal regulations**

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

Not regulated.

**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 Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65): This material is not known to contain any chemicals currently listed as carcinogens or reproductive toxins.

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>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).
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 12-14-2016
Version # 01

List of abbreviations ATE: Acute Toxicity Estimate according to REGULATION (EC) No 1272/2008 (CLP).

Disclaimer Zoetis Inc. believes that the information contained in this Safety Data Sheet is accurate, and while it is provided in good faith, it is without warranty of any kind, expressed or implied. If data for a hazard are not included in this document there is no known information at this time. The information in the sheet was written based on the best knowledge and experience currently available.

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