1. PRODUCT AND COMPANY IDENTIFICATION

Product name: ONYX® INSECTICIDE
Form code: 6206
Active Ingredient(s): Bifenthrin
Alternate Commercial Name: Biflex SFR
Synonyms: FMC 54800; (2-methyl[1,1'-biphenyl]-3-yl)methyl 3-(2-chloro-3,3,3-trifluoro-1-propenyl)-2,2-dimethylcyclopropanecarboxylate; IUPAC: 2-methylbiphenyl-3-ylmethyl (Z)-(1RS)-cis-3-(2-chloro-3,3,3-trifluoroprop-1-enyl)-2,2-dimethylcyclopropanecarboxylate.
Chemical Family: Pyrethroid Pesticide

2. Hazards identification

Appearance: amber liquid
Physical state: Liquid
Odor: hydrocarbon-like

Potential health effects

Principle Routes of Exposure: Skin contact, Eye contact, Inhalation. Ingestion.

Acute effects

- Eyes: Irritating to eyes.
- Skin: Irritating to skin. Prolonged or repeated contact may dry skin and cause irritation.
- Inhalation: May cause irritation of respiratory tract. May cause drowsiness and dizziness.
Ingestion
Toxic if swallowed. May cause central nervous system depression. Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea. Potential for aspiration if swallowed.

Chronic effects
Effects are expected to be similar to those that are seen with acute toxicity. Chronic exposure to aromatic hydrocarbons may cause headaches, dizziness, loss of sensations or feelings (such as numbness), and liver and kidney damage.

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

### 3. Composition/information on ingredients

#### Hazardous ingredients

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS-No</th>
<th>Weight %</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,1’-Biphenyl, bis(1-methylethyl)-</td>
<td>69009-90-1</td>
<td>30-40</td>
</tr>
<tr>
<td>Bifenthrin</td>
<td>82657-04-3</td>
<td>23.34</td>
</tr>
<tr>
<td>Petroleum distillates, hydrotreated light</td>
<td>64742-47-8</td>
<td>10-20</td>
</tr>
<tr>
<td>Benzenesulfonic acid, dodecyl-, branched, calcium</td>
<td>70528-83-5</td>
<td>1-5</td>
</tr>
</tbody>
</table>

### 4. First aid measures

#### Eye contact
Hold eyes open and rinse slowly and gently with water for 15 to 20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control center or doctor for further treatment advice.

#### Skin contact
Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice.

#### Inhalation
Move person to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably by mouth-to-mouth, if possible. Call a poison control center or doctor for further treatment advice.

#### Ingestion
Immediately call a poison control center or doctor. Do not induce vomiting unless told to do so by a poison control center or doctor. Do not give any liquid to the person. Do not induce vomiting or give anything by mouth to an unconscious person.

#### Notes to physician
Contains petroleum distillate. Vomiting may cause aspiration pneumonia. This product is a pyrethroid. If large amounts have been ingested, the stomach and intestines should be evacuated. Treatment is symptomatic and supportive. Digestible fats, oils, or alcohol may increase absorption and so should be avoided.

### 5. Fire-fighting measures

#### Flammable properties
Combustible liquid

#### Flash Point
67 °C / 153-158 °F

#### Sensitivity to Mechanical Impact
not applicable

#### Sensitivity to Static Discharge
not applicable

#### Suitable extinguishing media
Use CO2, dry chemical, or foam.

#### Hazardous combustion products
Toxic fumes may be produced.

#### Protective equipment and precautions for firefighters
As in any fire, wear self-contained breathing apparatus and full protective gear.

#### NFPA

<table>
<thead>
<tr>
<th>Health Hazard</th>
<th>Flammability</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>
6. Accidental release measures

Personal precautions
Isolate and post spill area. Remove all sources of ignition. Ventilate the area. Wear suitable protective clothing, gloves and eye/face protection. For personal protection see section 8.

Environmental precautions
Keep people and animals away from and upwind of spill/leak. Keep material out of lakes, streams, ponds, and sewer drains.

Methods for containment
Dike to prevent runoff. Absorb with earth, sand or other non-combustible material and transfer to containers for later disposal.

Methods for cleaning up
Clean and neutralize spill area, tools and equipment by washing with bleach water and soap. Absorb rinsate and add to the collected waste. Waste must be classified and labeled prior to recycling or disposal. Dispose of waste as indicated in Section 13.

Other
For further clean-up instructions call FMC Emergency Hotline number listed in Section 1 "Product and Company Identification" above.

7. Handling and storage

Handling
Do not contaminate other pesticides, fertilizers, water, food or feed by storage or disposal.

Storage
Keep in a dry, cool and well-ventilated place. Keep away from open flames, hot surfaces and sources of ignition. Keep out of reach of children and animals. Store in original container only.

8. Exposure controls/personal protection

Exposure guidelines

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>British Columbia</th>
<th>Quebec</th>
<th>Ontario TWAEV</th>
<th>Alberta</th>
</tr>
</thead>
<tbody>
<tr>
<td>Petroleum distillates, hydrotreated light 64742-47-8</td>
<td>TWA: 200 mg/m³ Skin</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Occupational exposure controls

Engineering measures
Apply technical measures to comply with the occupational exposure limits. When working in confined spaces (tanks, containers, etc.), ensure that there is a supply of air suitable for breathing and wear the recommended equipment.

Personal Protective Equipment

General Information
If the product is used in mixtures, it is recommended that you contact the appropriate protective equipment suppliers. These recommendations apply to the product as supplied.

Respiratory protection
For dust, splash, mist or spray exposures wear a filtering mask.

Eye/face protection
For dust, splash, mist or spray exposure, wear chemical protective goggles or a face-shield.

Skin and body protection
Wear long-sleeved shirt, long pants, socks, shoes, and gloves.

Hand protection
Protective gloves
Hygiene measures
Clean water should be available for washing in case of eye or skin contamination. Wash skin prior to eating, drinking, chewing gum or using tobacco. Shower or bathe at the end of working. Remove and wash contaminated clothing before re-use. Launder work clothing separately from regular household laundry.

9. Physical and chemical properties

9.1 Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>amber liquid</td>
</tr>
<tr>
<td>Color</td>
<td>amber</td>
</tr>
<tr>
<td>Physical state</td>
<td>Liquid</td>
</tr>
<tr>
<td>Odor</td>
<td>hydrocarbon-like</td>
</tr>
<tr>
<td>pH</td>
<td>No information available. 3.9</td>
</tr>
<tr>
<td>Melting Point/Range</td>
<td>No information available.</td>
</tr>
<tr>
<td>Freezing point</td>
<td>No information available.</td>
</tr>
<tr>
<td>Boiling Point/Range</td>
<td>not applicable</td>
</tr>
<tr>
<td>Flash Point</td>
<td>67 - 70 °C / 153-158 °F</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>not applicable</td>
</tr>
<tr>
<td>Flammable properties</td>
<td>Combustible liquid</td>
</tr>
<tr>
<td>Vapor pressure</td>
<td>No information available.</td>
</tr>
<tr>
<td>Vapor density</td>
<td>No information available.</td>
</tr>
<tr>
<td>Density</td>
<td>8.59 lb/gal</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>1.031 @ 20 °C</td>
</tr>
<tr>
<td>Water solubility</td>
<td>Emulsifies</td>
</tr>
<tr>
<td>Percent volatile</td>
<td>No information available.</td>
</tr>
<tr>
<td>Partition coefficient:</td>
<td>not applicable</td>
</tr>
<tr>
<td>Viscosity</td>
<td>No information available.</td>
</tr>
</tbody>
</table>

9.2 Other information

10. Stability and reactivity

Stability
Stable.

Conditions to avoid
Heat, flames and sparks

Hazardous decomposition products
May emit toxic fumes under fire conditions. Carbon oxides, Hydrogen chloride, Hydrogen fluoride.

Hazardous polymerization
Hazardous polymerization does not occur.

11. Toxicological information

Eye contact
Moderately irritating to skin rabbit.

Skin contact
Irritating to skin (rabbit).

Ingestion
Large doses of bifenthrin ingested by laboratory animals produced signs of toxicity including convulsions, tremors and bloody nasal discharge. Vomiting after ingestion of this product may cause aspiration of aromatic hydrocarbons into the lungs, which may result in fatal pulmonary edema.

Inhalation
Inhalation of hydrocarbon vapors may cause headaches, dizziness, disturbances in vision, drowsiness, respiratory irritation, anesthesia, unconsciousness, and other central nervous system effects.

LD50 Oral
> 2,000 mg/kg (rabbit)
153 mg/kg (rat)

Sensitization
Sensitizer
Chronic Toxicity - Other Ingredient(s)

Chronic Toxicity
Effects are expected to be similar to those that are seen with acute toxicity. Chronic exposure to aromatic hydrocarbons may cause headaches, dizziness, loss of sensations or feelings (such as numbness), and liver and kidney damage.

Carcinogenicity
Bifenthrin: Did not show carcinogenic effects in animal experiments.

Mutagenicity
Bifenthrin: Not genotoxic.

Reproductive toxicity
Bifenthrin: No toxicity to reproduction.

Neurological Effects
Tremors were associated with chronic exposure of laboratory animals to bifenthrin, which may disappear with continued exposure.

Developmental Toxicity
Bifenthrin: Not teratogenic in animal studies

Target Organ Effects
Bifenthrin: A slight increase in male mouse urinary bladder tumors at the highest dose was probably not of toxicological concern.

12. Ecological information

Ecotoxicity

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Toxicity to algae</th>
<th>Toxicity to fish</th>
<th>Toxicity to microorganisms</th>
<th>Toxicity to daphnia and other aquatic invertebrates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Petroleum distillates, hydrotreated light</td>
<td>LC50 = 45 mg/L Pimephales promelas 96 h LC50 = 2.2 mg/L Lepomis macrochirus 96 h LC50 = 2.4 mg/L Oncorhynchus mykiss 96 h</td>
<td></td>
<td></td>
<td>LC50 = 4720 mg/L 96 h</td>
</tr>
</tbody>
</table>

Environmental Fate

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Type of Test</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bifenthrin (82657-04-3)</td>
<td>Bioconcentration factor (BCF)</td>
<td>1709</td>
</tr>
<tr>
<td>Bifenthrin</td>
<td>Half-life in soil</td>
<td>~85 days</td>
</tr>
<tr>
<td>Bifenthrin</td>
<td>Log Pow</td>
<td>6.6</td>
</tr>
<tr>
<td>Bifenthrin</td>
<td>Mobility in soil</td>
<td>Not expected to reach groundwater</td>
</tr>
<tr>
<td>Bifenthrin</td>
<td>Stability in water</td>
<td>Stable to hydrolysis over a wide range of pH values.</td>
</tr>
</tbody>
</table>

Persistence and degradability
Inherently biodegradable.

13. Disposal considerations

Waste disposal methods
Pesticide wastes are toxic. Improper disposal of excess pesticide, spray mixture, or rinsate is prohibited. If these wastes cannot be disposed of by use according to label instructions, contact appropriate disposal authorities for guidance.
Contaminated packaging

Containers must be disposed of in accordance with local, state and federal regulations. Refer to the product label for container disposal instructions.

14. Transport information

DOT

USDOT is requiring that products formerly classified as "Consumer Commodity, ORM-D" transition to "Limited Quantity" by 1/1/2014. During the transition period the 49CFR carton shipping marks may be Consumer Commodity (old) or Limited Quantity Diamond (new). Please prepare shipping documents to match the carton mark.

<table>
<thead>
<tr>
<th>Packaging Type</th>
<th>Non-Bulk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proper shipping name</td>
<td>Pyrethroid pesticide, liquid, toxic</td>
</tr>
<tr>
<td>UN/ID No</td>
<td>UN3352</td>
</tr>
<tr>
<td>Hazard Class</td>
<td>6.1</td>
</tr>
<tr>
<td>Packing group</td>
<td>III</td>
</tr>
</tbody>
</table>

TDG

The "Marine Pollutant" marking is only applicable when shipped by vessel, and is not applicable when shipped only by road or rail in Canada.

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<thead>
<tr>
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<th>UN3352</th>
</tr>
</thead>
<tbody>
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</tr>
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<td>Hazard Class</td>
<td>6.1</td>
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<tr>
<td>Packing group</td>
<td>III</td>
</tr>
<tr>
<td>Marine pollutant</td>
<td>Bifenthrin.</td>
</tr>
</tbody>
</table>

ICAO/IATA

<table>
<thead>
<tr>
<th>UN/ID No</th>
<th>UN3352</th>
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</tr>
<tr>
<td>Packing group</td>
<td>III</td>
</tr>
<tr>
<td>Marine pollutant</td>
<td>Bifenthrin.</td>
</tr>
<tr>
<td>Limited quantity</td>
<td>611 / 60L</td>
</tr>
</tbody>
</table>

IMDG/IMO

<table>
<thead>
<tr>
<th>UN/ID No</th>
<th>UN3352</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proper shipping name</td>
<td>Pyrethroid pesticide, liquid, toxic</td>
</tr>
<tr>
<td>Hazard Class</td>
<td>6.1</td>
</tr>
<tr>
<td>Packing group</td>
<td>III</td>
</tr>
<tr>
<td>Marine pollutant</td>
<td>Bifenthrin.</td>
</tr>
</tbody>
</table>
15. Regulatory information

U.S. Federal Regulations
SARA 313
Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product contains a chemical or chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372:

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS-No</th>
<th>Weight %</th>
<th>SARA 313 - Threshold Values %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bifenthrin</td>
<td>82657-04-3</td>
<td>23.34</td>
<td>1.0</td>
</tr>
</tbody>
</table>

SARA 311/312 Hazard Categories
- Acute Health Hazard: yes
- Chronic Health Hazard: yes
- Fire Hazard: yes
- Sudden Release of Pressure Hazard: no
- Reactive Hazard: no

CERCLA
This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional, or state level pertaining to releases of this material.

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>U.S. - TSCA (Toxic Substances Control Act) - Section 8(d) - 716.120(a) - Health and Safety Reporting - List of Substances 06/28/1984</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,1'-Biphenyl, bis(1-methylethyl)-</td>
<td></td>
</tr>
</tbody>
</table>

International Regulations

Mexico - Grade
No information available.

Canada
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

WHMIS Hazard Class
- B3 Combustible liquid
- D1B Toxic materials
- D2B Toxic materials
16. Other information

Revision Date: 2013-03-18
Reason for revision: (M)SDS sections updated.

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End of Material Safety Data Sheet