1. PRODUCT AND COMPANY IDENTIFICATION

Product name
Talstar® Xtra Granular Insecticide Featuring Verge Granule Technology

Active Ingredient(s)
Bifenthrin, Zeta-cypermethrin

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-trifluoro-1-propenyl)-2,2-dimethylcyclopropanecarboxylate; FMC 233570; (+/-)-α-cyano(3-phenoxyphenyl)methyl (+/-) cis, trans-3-(2,2-dichloroethenyl)-2,2-dimethylcyclopropanecarboxylate; IUPAC: (RS)-α-cyano-3-phenoxybenzyl (1RS)-cis-trans-3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropanecarboxylate; F2700

Chemical Family
Pyrethroid Pesticide

Recommended use:
Insecticide

Manufacturer
FMC Corporation
Agricultural Products Group
1735 Market Street
Philadelphia, PA 19103

Medical Emergencies:
1 800 / 331-3148 (PROSAR - U.S.A. & Canada)
1 651 / 632-6793 (PROSAR - All Other Countries - Collect)

For leak, fire, spill or accident emergencies, call:
1 800 / 424 9300 (CHEMTREC - U.S.A.)
1 703 / 527 3887 (CHEMTREC - Collect - All Other Countries)

E-Mail: msdsinfo@fmc.com

2. HAZARDS IDENTIFICATION

Appearance
granules

Physical state
solid

Odor
Mild detergent odor

Physical or Chemical Hazards

Flammable properties
Powdered material may form explosive dust-air mixtures

Potential health effects
Eye contact, Skin contact, Inhalation, Ingestion.

Principle Routes of Exposure

Acute effects

Eyes
Moderately irritating to skin.

Skin
May cause sensitization by skin contact. Substance may cause slight skin irritation.

Inhalation
May cause irritation of respiratory tract.
Ingestion

Harmful if swallowed. Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea.
May cause central nervous system depression.

Chronic effects

Repeated or prolonged exposure may cause central nervous system effects.

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>bentonite</td>
<td>1302-78-9</td>
<td>80-90</td>
</tr>
<tr>
<td>crystalline silica, quartz</td>
<td>14808-60-7</td>
<td>5-10</td>
</tr>
<tr>
<td>Hexylene Glycol</td>
<td>107-41-5</td>
<td>1-5</td>
</tr>
<tr>
<td>1,1’-Biphenyl, bis(1-methylethyl)-</td>
<td>69009-90-1</td>
<td>1-5</td>
</tr>
<tr>
<td>Bifenthrin</td>
<td>82657-04-3</td>
<td>0.2</td>
</tr>
<tr>
<td>Zeta-cypermethrin</td>
<td>52315-07-8</td>
<td>0.05</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 (within the U.S. and Canada) 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**
Call a poison control center or doctor immediately for treatment advice. Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by a poison control center or doctor. Do not give anything by mouth to an unconscious person.

**Notes to physician**
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**
Powdered material may form explosive dust-air mixtures

**Sensitivity to Mechanical Impact**
Not applicable

**Sensitivity to Static Discharge**
Not applicable

**Suitable extinguishing media**
Foam. Carbon dioxide (CO₂). Dry chemical. Water spray or fog.

**Protective equipment and precautions for firefighters**
As in any fire, wear self-contained breathing apparatus and full protective gear. Isolate fire area. Evaluate downwind.

**NFPA**

| Health Hazard | 2 |
| Flammability   | 1 |
| Stability      | 0 |
| Special Hazards| - |
6. ACCIDENTAL RELEASE MEASURES

Personal precautions
Isolate and post spill 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 cleaning up
Sweep up and shovel into suitable containers for disposal. 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 CONTROL / PERSONAL PROTECTION

Exposure guidelines

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>ACGIH TLV</th>
<th>OSHA PEL</th>
<th>NIOSH</th>
<th>Mexico</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bentonite 1302-78-9</td>
<td>TWA: 1 mg/m³</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crystalline silica, quartz 14808-60-7</td>
<td>TWA: 0.025 mg/m³</td>
<td></td>
<td>IDLH: 50 mg/m³</td>
<td>TWA: 0.05 mg/m³</td>
</tr>
<tr>
<td>Hexylene Glycol 107-41-5</td>
<td>Ceiling: 25 ppm</td>
<td></td>
<td>Ceiling: 125 mg/m³</td>
<td></td>
</tr>
<tr>
<td>Chemical Name</td>
<td>British Columbia</td>
<td>Quebec</td>
<td>Ontario TWAEV</td>
<td>Alberta</td>
</tr>
<tr>
<td>Bentonite 1302-78-9</td>
<td>TWA: 1.0 mg/m³</td>
<td></td>
<td>TWA: 1 mg/m³</td>
<td></td>
</tr>
<tr>
<td>Crystalline silica, quartz 14808-60-7</td>
<td>TWA: 0.025 mg/m³</td>
<td>TWA: 0.1 mg/m³</td>
<td>TWA: 0.10 mg/m³</td>
<td>TWA: 0.025 mg/m³</td>
</tr>
<tr>
<td>Hexylene Glycol 107-41-5</td>
<td>Ceiling: 25 ppm</td>
<td>Ceiling: 25 ppm Ceiling: 121 mg/m³</td>
<td>CEV: 25 ppm</td>
<td>Ceiling: 25 ppm Ceiling: 121 mg/m³</td>
</tr>
</tbody>
</table>

Occupational exposure controls

Engineering measures
Apply technical measures to comply with the occupational exposure limits. Ensure adequate ventilation, especially in confined areas. 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, chemical-resistant gloves and headgear.

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

Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>granules</td>
</tr>
<tr>
<td>Color</td>
<td>gray</td>
</tr>
<tr>
<td>Physical state</td>
<td>solid</td>
</tr>
<tr>
<td>Odor</td>
<td>Mild detergent odor</td>
</tr>
<tr>
<td>pH</td>
<td>6.5 - 7.0</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>Not applicable</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Flammable properties</td>
<td>Powdered material may form explosive dust-air mixtures</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>Water solubility</td>
<td>Dispersible in water</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>

10. STABILITY AND REACTIVITY

Stability
Stable under recommended storage conditions.

Conditions to avoid
Heat, flames and sparks

Hazardous decomposition products

Hazardous polymerization
Hazardous polymerization does not occur.

11. TOXICOLOGICAL INFORMATION

Acute effects
Eye contact
Moderately irritating to skin
Skin contact
May cause slight irritation

LD50 Dermal
> 5000 mg/kg (rabbit)
LD50 Oral
550 mg/kg (Rat)
LC50 Inhalation:
> 2.11 mg/L (Rat)

Sensitization
This product produces skin sensitization (allergic reaction) in laboratory animals, and may produce similar effects in humans.

Chronic effects
Chronic Toxicity
Repeated or prolonged exposure may cause central nervous system effects.
Carcinogenicity

Bifenthrin: Not recognized as carcinogenic by Research Agencies (IARC, NTP, OSHA, ACGIH). Did not show carcinogenic effects in animal experiments. Cypermethrin caused an increase in benign lung tumors in mice, but not in rats, and was negative for genotoxicity. EPA has classified zeta-cypermethrin as a possible human carcinogen based on this information, but does not regulate based on its low cancer risk.

Mutagenicity

Bifenthrin, Zeta-cypermethrin: Not genotoxic.

Reproductive toxicity

Zeta-cypermethrin: No toxicity to reproduction.

Neurological Effects

Tremors were associated with chronic exposure of laboratory animals to bifenthrin, which may disappear with continued exposure. Cypermethrin did not cause neurotoxicity in animal experiments.

Developmental Toxicity

Bifenthrin, Zeta-cypermethrin: 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.

Chronic Toxicity - Other Ingredient(s)

Repeated overexposure to crystalline silica for extended periods has caused acute silicosis.

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>ACGIH</th>
<th>IARC</th>
<th>NTP</th>
<th>OSHA</th>
<th>NIOSH - Target Organs</th>
</tr>
</thead>
<tbody>
<tr>
<td>crystalline silica, quartz</td>
<td>A2</td>
<td>1</td>
<td>Known</td>
<td>X</td>
<td>eyes, respiratory system</td>
</tr>
<tr>
<td>Hexylene Glycol</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>eyes, CNS, respiratory system, skin</td>
</tr>
</tbody>
</table>

12. ECOLOGICAL INFORMATION

Marine pollutant

Zeta-cypermethrin

Ecotoxicity

Bifenthrin (82657-04-3)

<table>
<thead>
<tr>
<th>Active Ingredient(s)</th>
<th>Duration</th>
<th>Species</th>
<th>Value</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bifenthrin</td>
<td>EC50</td>
<td>Aquatic organisms</td>
<td>0.11 - 0.57</td>
<td>µg/L</td>
</tr>
<tr>
<td>Bifenthrin</td>
<td>96 h LC50</td>
<td>Fish</td>
<td>0.1 - 2.0</td>
<td>µg/L</td>
</tr>
<tr>
<td>Bifenthrin Oral</td>
<td>LD50</td>
<td>Bobwhite quail</td>
<td>&gt;1800</td>
<td>mg/kg</td>
</tr>
<tr>
<td>Bifenthrin Oral</td>
<td>LD50 Oral</td>
<td>Mallard duck</td>
<td>&gt;2150</td>
<td>mg/kg</td>
</tr>
<tr>
<td>Bifenthrin Oral</td>
<td>LD50</td>
<td>Bee</td>
<td>0.1</td>
<td>µg/bee</td>
</tr>
</tbody>
</table>

Zeta-cypermethrin (52315-07-8)

<table>
<thead>
<tr>
<th>Active Ingredient(s)</th>
<th>Duration</th>
<th>Species</th>
<th>Value</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zeta-cypermethrin</td>
<td>LC50</td>
<td>Aquatic organisms</td>
<td>0.005 - 0.15</td>
<td>µg/L</td>
</tr>
<tr>
<td>Zeta-cypermethrin</td>
<td>LC50</td>
<td>Fish</td>
<td>0.07 - 2.37</td>
<td>µg/L</td>
</tr>
<tr>
<td>Zeta-cypermethrin</td>
<td>LD50 Oral</td>
<td>Bobwhite quail</td>
<td>&gt;2000</td>
<td>mg/kg</td>
</tr>
<tr>
<td>Zeta-cypermethrin</td>
<td>LD50</td>
<td>Bee</td>
<td>0.0014 - 0.043</td>
<td>µg/bee</td>
</tr>
</tbody>
</table>

<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>bentonite</td>
<td>LC50 8.0 - 19.0 g/L Salmo gairdneri 96 h LC50= 19000 mg/L Oncorhynchus mykiss 96 h</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hexylene Glycol</td>
<td>LC50 10500 - 11000 mg/L Pimephales promelas 96 h LC50= 10000 mg/L Lepomis macrochirius 96 h LC50= 8690 mg/L Pimephales promelas 96 h LC50= 10700 mg/L Pimephales promelas 96 h</td>
<td></td>
<td></td>
<td>EC50 2700 - 3700 mg/L 48 h</td>
</tr>
</tbody>
</table>
Environmental Fate

Bifenthrin (82657-04-3)

<table>
<thead>
<tr>
<th>Active Ingredient(s)</th>
<th>Type of Test</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bifenthrin</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>

Zeta-cypermethrin (52315-07-8)

<table>
<thead>
<tr>
<th>Active Ingredient(s)</th>
<th>Type of Test</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zeta-cypermethrin</td>
<td>Bioconcentration factor (BCF) Bluefill sunfish (Lepomis macrochirus)</td>
<td>443</td>
</tr>
<tr>
<td></td>
<td>Half-life in soil</td>
<td>2 - 4 weeks</td>
</tr>
<tr>
<td></td>
<td>log Pow</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Mobility in soil</td>
<td>Not expected to reach groundwater</td>
</tr>
<tr>
<td></td>
<td>Stability in water</td>
<td>Hydrolysis unstable at pH 9, half life 20-29 days at pH 5 and 7.</td>
</tr>
</tbody>
</table>

Chemical Name | log Pow
---|---
Hexylene Glycol | <0.14

13. DISPOSAL CONSIDERATIONS

Waste disposal methods
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
Not regulated for transportation if shipped in Non Bulk packaging. The classification below pertains to the shipment in Bulk packaging.

UN/ID No: UN3077
Hazard Class: 9
Packing group: III
Marine pollutant: Zeta-cypermethrin
Description: UN3077 Environmentally hazardous substances, solid, n.o.s. (Zeta-cypermethrin), 9 PG III

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

UN/ID No: UN3077
Hazard Class: 9
Packing group: III
Marine pollutant: Bifenthrin, Zeta-cypermethrin.
Description: UN3077, Environmentally hazardous substance, solid, n.o.s. (Bifenthrin, Zeta-cypermethrin), 9, PG III

ICAO/IATA
UN/ID No: UN3077
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>0.2</td>
<td>1.0</td>
</tr>
</tbody>
</table>

SARA 311/312 Hazard Categories
- Acute Health Hazard: yes
- Chronic Health Hazard: yes
- Fire Hazard: no
- 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.

TSCA Inventory (United States of America)

<table>
<thead>
<tr>
<th>Component</th>
<th>U.S. - TSCA (Toxic Substances Control Act) - Section 8(d) - 716.120(a) - Health and Safety Reporting - List of Substances</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,1'-Biphenyl, bis(1-methylethyl)-69009-90-1 (1-5)</td>
<td>06/28/1984</td>
</tr>
</tbody>
</table>

International Regulations

Mexico - Grade
Moderate risk, Grade 2

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
- D2A Very toxic materials
- D2B Toxic materials
16. OTHER INFORMATION

Revision Date: 2013-10-11
Reason for revision: Initial Release.

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Prepared By

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End of Material Safety Data Sheet