MATERIAL SAFETY DATA SHEET

SECTION 1 - IDENTIFICATION OF PRODUCT AND COMPANY

Pfizer Inc
Pfizer Animal Health
235 East 42nd Street
New York, NY 10017

Emergency telephone 1-866-531-8896
Hours of operation 24 Hours
Telephone 1-800-366-5288

Product name REVOLUTION® - Single dose tubes

Synonyms Selamectin formulation

Chemical family Avermectin/milbemycin derivative

Therapeutic use Antiparasitic (veterinary); endectocide

Description Clear, yellow to colorless liquid, with a slight adherent texture; characteristic alcohol odor packaged in 2 mL or less single dose tubes

SECTION 2 - COMPOSITION

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>CAS Number</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Selamectin*</td>
<td>165108-07-6</td>
<td>7.4 - 14.2%</td>
</tr>
<tr>
<td>Isopropyl alcohol*</td>
<td>67-63-0</td>
<td>72.5 - 85.6%</td>
</tr>
<tr>
<td>Dipropylene glycol methyl ether*</td>
<td>34590-94-8</td>
<td>Trade secret</td>
</tr>
<tr>
<td>Butylated hydroxytoluene*</td>
<td>128-37-0</td>
<td>Trade secret</td>
</tr>
</tbody>
</table>

*Hazardous

Note: Ingredient(s) indicated as hazardous have been assessed under standards for workplace safety.

SECTION 3 - HAZARDS IDENTIFICATION

Signal word WARNING!

Statements of hazard FLAMMABLE LIQUID AND VAPOR

MAY CAUSE EYE IRRITATION

MAY CAUSE LIVER AND REPRODUCTIVE SYSTEM EFFECTS

POSSIBLE RISK OF HARM TO THE UNBORN CHILD

DANGEROUS FOR THE ENVIRONMENT

Eye effects May cause eye irritation (based on animal data).

Skin effects Prolonged or repeated contact may cause defatting dermatitis (dryness and cracking of the skin).
SECTION 3 - HAZARDS IDENTIFICATION

Inhalation effects
An Occupational Exposure Limit has been established for one or more of the ingredients (see Section 8). See 'Statements of hazard' and/or 'Other potential health effects' in this section.

Ingestion effects
Not acutely toxic (based on animal data). See 'Statements of hazard' and 'Other potential health effects' in this section.

Other potential health effects
Signs and symptoms of isopropanol overexposure may include headache, dizziness, drowsiness, and loss of consciousness.

Repeat-dose studies in animals have shown a potential to cause adverse effects on the liver and reproductive system and harm to the developing fetus.

NOTE:
This document has been prepared in accordance with standards for workplace safety, which require the inclusion of all known hazards of the product or its ingredients regardless of the potential risk. The precautionary statements and warnings included may not apply in all cases. Your needs may vary depending upon the potential for exposure in your workplace.

SECTION 4 - FIRST AID MEASURES

Skin
Remove clothing and wash affected skin with soap and water. This material may not be completely removed by conventional laundering. Consult professional laundry service. Do not home launder. If irritation occurs or persists, get medical attention.

Eyes
Immediately flush eyes with water for at least 15 minutes. If irritation occurs or persists, get medical attention.

Inhalation
Remove to fresh air. If not breathing, give artificial respiration. Get medical attention.

Ingestion
Get medical attention. Do not induce vomiting unless directed by medical personnel. Never give anything by mouth to an unconscious person.

SECTION 5 - FIRE FIGHTING MEASURES

General hazard
Flammable liquid Vapors may form explosive mixture with air. Toxic gases may be emitted in fires of this material.

Fire fighting instructions
Wear approved positive pressure, self-contained breathing apparatus and full protective turn out gear. All reasonable attempts should be made to prevent firewaters from entering surface waters.

Extinguishing media
Carbon dioxide, dry chemical, or foam

Flash point
66 °F
SECTION 5 - FIRE FIGHTING MEASURES  ... continued

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Autoignition</td>
<td>No data available</td>
</tr>
<tr>
<td>Minimum explosive concentration</td>
<td>Not known</td>
</tr>
<tr>
<td>for dust/vapor</td>
<td></td>
</tr>
<tr>
<td>Flammability limits</td>
<td>No data available</td>
</tr>
<tr>
<td>Hazardous combustion products</td>
<td>Not known</td>
</tr>
</tbody>
</table>

SECTION 6 - ACCIDENTAL RELEASE MEASURES

General
Review Sections 3, 8 and 12 before proceeding with clean up.

Small spill
Absorb spills with non-combustible absorbent material and transfer into a labeled container for disposal. Clean spill area thoroughly. Prevent discharge to drains.

Large spill
Collect spill with a non-combustible absorbent material and transfer to labeled container for disposal. Close container and move it to a secure holding area. Prevent discharge to drains.

SECTION 7 - HANDLING AND STORAGE

General handling
Eliminate possible ignition sources (e.g., heat, sparks, flame, impact, friction, electricity), and follow appropriate grounding and bonding procedures. Use with adequate ventilation. Avoid contact with eyes, skin and clothing. Avoid breathing vapor or mist.

Storage conditions
Store in a cool, dry place away from direct sunlight. Store above freezing point (19 °F).

Temperature range for storage
< 30 °C

SECTION 8 - EXPOSURE CONTROLS/PERSONAL PROTECTION

<table>
<thead>
<tr>
<th>Compound</th>
<th>Issuer</th>
<th>Type</th>
<th>OEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Selamectin</td>
<td>Pfizer</td>
<td>TWA-8 Hr</td>
<td>0.2 mg/m³</td>
</tr>
<tr>
<td>Isopropyl alcohol</td>
<td>OSHA</td>
<td>TWA-8 Hr</td>
<td>400 ppm</td>
</tr>
<tr>
<td></td>
<td>ACGIH</td>
<td>TWA-8 Hr</td>
<td>200 ppm</td>
</tr>
<tr>
<td></td>
<td>ACGIH</td>
<td>STEL (15 min)</td>
<td>400 ppm</td>
</tr>
<tr>
<td>Dipropylene glycol methyl ether</td>
<td>OSHA</td>
<td>TWA-8 Hr</td>
<td>100 ppm (skin)</td>
</tr>
<tr>
<td></td>
<td>ACGIH</td>
<td>TWA-8 Hr</td>
<td>150 ppm</td>
</tr>
</tbody>
</table>
SECTION 8 - EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure limits

<table>
<thead>
<tr>
<th>Compound</th>
<th>Issuer</th>
<th>Type</th>
<th>OEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Butylated hydroxytoluene</td>
<td>OSHA</td>
<td>STEL</td>
<td>100 ppm (skin)</td>
</tr>
<tr>
<td></td>
<td>OSHA</td>
<td>TWA-8 Hr</td>
<td>150 ppm</td>
</tr>
<tr>
<td></td>
<td>ACGIH</td>
<td>TWA-8 Hr</td>
<td>10 mg/m³</td>
</tr>
</tbody>
</table>

Measurement method
Selamectin: CAM-KAS-99-006 (Contact Pfizer for further details).

Ventilation
Engineering controls should be used as the primary means to control exposures. Local exhaust ventilation is required unless used in a closed system. For laboratory use, handle in a lab fume hood.

Respiratory protection
If the applicable Occupational Exposure Limit (OEL) is exceeded, wear an appropriate respirator with a protection factor sufficient to control exposures to below the OEL.

Eye protection
Safety glasses or goggles

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

Hand protection
Rubber gloves

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical form</td>
<td>Liquid</td>
</tr>
<tr>
<td>Color</td>
<td>Yellow to colorless</td>
</tr>
<tr>
<td>Clarity</td>
<td>Clear</td>
</tr>
<tr>
<td>Odor</td>
<td>Characteristic alcohol odor</td>
</tr>
<tr>
<td>Molecular weight</td>
<td>Mixture</td>
</tr>
<tr>
<td>Molecular formula</td>
<td>Mixture</td>
</tr>
<tr>
<td>pH</td>
<td>No data available</td>
</tr>
<tr>
<td>Boiling point</td>
<td>183 °F</td>
</tr>
<tr>
<td>Melting point</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Density</td>
<td>0.815 - 0.847 g/mL at 25 °C</td>
</tr>
<tr>
<td>Vapor pressure</td>
<td>No data available</td>
</tr>
<tr>
<td>Water solubility</td>
<td>Miscible</td>
</tr>
<tr>
<td>Solvent solubility</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>
SECTION 10 - STABILITY AND REACTIVITY

Reactivity
Stable under normal conditions of use.

Conditions to avoid
Avoid direct sunlight, conditions that might generate heat, and sources of ignition.

Incompatibilities
None known

Hazardous decomposition products
None known

Hazardous polymerization
Will not occur

Oxidizing properties
No data available

SECTION 11 - TOXICOLOGY INFORMATION

Toxicology summary
The information included in this section describes the potential hazards of the individual ingredients, except where noted.

Acute toxicity

<table>
<thead>
<tr>
<th>Compound</th>
<th>Type</th>
<th>Route</th>
<th>Species</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Selamectin</td>
<td>LD&lt;sub&gt;50&lt;/sub&gt;</td>
<td>Oral</td>
<td>Rat</td>
<td>&gt;1600 mg/kg</td>
</tr>
<tr>
<td></td>
<td>Irritation</td>
<td>Dermal</td>
<td>Rabbit</td>
<td>Very slight</td>
</tr>
<tr>
<td></td>
<td>Irritation</td>
<td>Ocular</td>
<td>Rabbit</td>
<td>Slight</td>
</tr>
<tr>
<td>Isopropyl alcohol</td>
<td>LD&lt;sub&gt;50&lt;/sub&gt;</td>
<td>Oral</td>
<td>Rat</td>
<td>&gt;2000 mg/kg</td>
</tr>
<tr>
<td></td>
<td>LD&lt;sub&gt;50&lt;/sub&gt;</td>
<td>Inhalation</td>
<td>Rat</td>
<td>16,000 ppm</td>
</tr>
<tr>
<td></td>
<td>LC50</td>
<td>Dermal</td>
<td>Rabbit</td>
<td>13400 mg/kg</td>
</tr>
<tr>
<td></td>
<td>LC50</td>
<td>Inhalation</td>
<td>Rat</td>
<td>30 mg/l</td>
</tr>
<tr>
<td></td>
<td>Irritation</td>
<td>Ocular</td>
<td>Rabbit</td>
<td>Severe</td>
</tr>
<tr>
<td></td>
<td>Irritation</td>
<td>Dermal</td>
<td>Rabbit</td>
<td>Mild</td>
</tr>
<tr>
<td>Dipropylene glycol methyl ether</td>
<td>LD&lt;sub&gt;50&lt;/sub&gt;</td>
<td>Oral</td>
<td>Dog</td>
<td>7500 mg/kg</td>
</tr>
<tr>
<td>Butylated hydroxytoluene</td>
<td>LD&lt;sub&gt;50&lt;/sub&gt;</td>
<td>Oral</td>
<td>Rat</td>
<td>890 mg/kg</td>
</tr>
</tbody>
</table>

Eye
See Acute toxicity table.

Skin
Transfer of selamectin across human skin has been evaluated in \textit{in vitro} models. These studies show that a very small amount of selamectin is transferred across human skin. Further analysis to predict user safety was conducted assuming a worst case scenario. Results of this analysis suggests that, if the entire 2 ml dose was spilled onto the skin and was not washed off, the amount absorbed would be 279 times less than the dose which showed no effect in rat toxicity studies.

REVOLUTION® was not irritating in animal studies.

Inhalation
See Acute toxicity table

Ingestion
See Acute toxicity table.
SECTION 11 - TOXICOLOGY INFORMATION

Mutagenicity
Selamectin and isopropanol have been tested extensively and are not mutagenic.

Sensitization
Selamectin was negative in the guinea pig maximization test.

Subchronic effects
Selamectin was administered to male and female rats for 3 months. Effects seen included increased liver enzymes and hematological changes along with decreased cholesterol, triglyceride, and glucose levels. Histological changes, including changes to the liver (mild to moderate fatty changes), lymphatics (lymphatic dilatation of the GI tract) and adrenals (hypertrophy) were also observed. The NOAEL for females was 5 mg/kg/day. There was no NOAEL in males.

Chronic effects/carcinogenicity
No data available

Carcinogen status
None of the components of this formulation are listed as a carcinogen by IARC, NTP or OSHA.

Reproductive effects
Treatment with selamectin resulted in reduced fertility (females only), and litter size, with a corresponding decrease in pup survival, in rats receiving the 60 mg/kg/day dose. An increase in the length of gestation was seen in animals receiving 25 and 60 mg/kg/day. Maternal toxicity was evident at 60 mg/kg/day.

Teratogenicity
The offspring of rats treated with 40 and 60 mg/kg/day of selamectin showed an increased incidence of enlarged right atria, along with an increase in fibrin material in the thoracic cavity. Maternal toxicity was evident at 60 mg/kg/day but not at 40 mg/kg/day.

SECTION 12 - ECOLOGICAL INFORMATION

Environmental overview
In the environment, the active ingredient in this formulation is expected to bind tightly to soil and sediment, and persist. Harm to aquatic organisms is expected.

Mobility, persistence, and degradability:
The active ingredient in this formulation is poorly water soluble and binds tightly to soil. It is expected to partition to soil, sediment, and to solids in a wastewater treatment facility and persist.

Bioaccumulation and toxicity:
High acute toxicity to aquatic organisms is expected. The active ingredient in this formulation has the potential to bioconcentrate and long term effects are possible. No toxicity to wastewater treatment microorganisms is expected.
SECTION 12 - ECOLOGICAL INFORMATION

Aquatic toxicity

<table>
<thead>
<tr>
<th>Compound</th>
<th>Type</th>
<th>Species</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Selamectin</td>
<td>LC50/48h</td>
<td>Daphnia magna</td>
<td>26 ng/l</td>
</tr>
<tr>
<td></td>
<td>LC50/96h</td>
<td>Mysid Shrimp</td>
<td>28 ng/l</td>
</tr>
<tr>
<td></td>
<td>LC50/48h</td>
<td>Sheepshead Minnow</td>
<td>&gt;500 mcg/l</td>
</tr>
<tr>
<td></td>
<td>NOEC</td>
<td>Selenastrum capricornutum</td>
<td>&gt;763 mcg/l</td>
</tr>
<tr>
<td></td>
<td>LC50/96h</td>
<td>Rainbow Trout</td>
<td>266 mcg/l</td>
</tr>
<tr>
<td></td>
<td>EC50</td>
<td>Red Algae</td>
<td>28 mcg/l</td>
</tr>
</tbody>
</table>

Note: A greater than (>) symbol indicates that toxic effects were not observed at the maximum solubility.

SECTION 13 - DISPOSAL INFORMATION

Disposal procedure
Do not dispose of even small amounts in the sanitary sewer, stormwater sewer, lakes, streams, or ponds. Incineration is the recommended method of disposal for this material. Observe all local and national regulations when disposing of this material.

SECTION 14 - TRANSPORTATION INFORMATION

General shipping instructions
This material is regulated for transportation as a hazardous material/dangerous good.

Proper shipping name
Flammable liquid, n.o.s. (contains isopropanol)
Marine pollutant when shipped in bulk quantities or by water

Identification number
UN 1993

Hazard class
3 (Flammable liquid)

Packing group
II

Note:
For small quantities packed in combination packaging [limited to inner packaging ≤ 1.0L (0.3 gal) and outer packaging ≤ 30 kg (66 lb.) gross weight], the following will apply:

U.S. DOT proper shipping name
Consumer Commodity

U.S. DOT hazard class
ORM-D

IATA proper shipping name
Consumer Commodity

IATA identification number
ID 8000

IATA hazard class
Miscellaneous (mark ORM-D Air)
**SECTION 14 - TRANSPORTATION INFORMATION**

<table>
<thead>
<tr>
<th>IMDG proper shipping name</th>
<th>Flammable liquid, n.o.s. (contains isopropanol), Ltd. Qty, Marine Pollutant</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMDG Identification No.</td>
<td>UN 1993</td>
</tr>
<tr>
<td>IMDG hazard class</td>
<td>3</td>
</tr>
<tr>
<td>IMDG packing group</td>
<td>II</td>
</tr>
<tr>
<td></td>
<td>Flashpoint = 66°F</td>
</tr>
</tbody>
</table>

**SECTION 15 - REGULATORY INFORMATION**

<table>
<thead>
<tr>
<th>EU Classification</th>
<th>Flammable; Irritant; Toxic to Reproduction; Category 3; Dangerous for the Environment</th>
</tr>
</thead>
<tbody>
<tr>
<td>EU Labelling</td>
<td>F; Xn; N</td>
</tr>
<tr>
<td>EU Label Pictogram(s)</td>
<td><img src="image" alt="Flammable Pictogram" /> <img src="image" alt="X Pictogram" /> <img src="image" alt="N Pictogram" /></td>
</tr>
</tbody>
</table>

| Risk phrases | R11 - Highly flammable.  
R36 - Irritating to eyes.  
R50/53 - Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.  
R62 - Possible risk of impaired fertility.  
R63 - Possible risk of harm to the unborn child.  
R67 - Vapors may cause drowsiness and dizziness |
|-------------|----------------------------------------------------------------------------------|
| Safety phrases | S16 - Keep away from sources of ignition - No smoking.  
S26 - In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.  
S36/37 - Wear suitable protective clothing and gloves.  
S53 - Avoid exposure - obtain special instructions before use.  
S57 - Use appropriate containment to avoid environmental contamination. |

| Canadian WHMIS | Class B, Division 2 (flammable liquid)  
Class D, Division 2, Subdivision A  
Class D, Division 2, Subdivision B |
|----------------|----------------------------------------------------------------------------------|

**SECTION 16 - OTHER**

**Disclaimer**

Pfizer Inc believes that the information contained in this Material Safety Data Sheet is accurate, and while it is provided in good faith, it is without a warranty of any kind, expressed or implied.