SECTION 1 - PRODUCT & COMPANY IDENTIFICATION

ARYSTA LifeScience South Africa (Pty) Ltd
Co. Reg. No.: 2009/019713/07
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Off Douglas Saunders Drive,
La Lucia Ridge, South Africa, 4019

Tel: 031 514 5600
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e-mail: info@arysta.co.za
Web address: arystalifescience.co.za

Substance: kresoxim-methyl.
Product Name: KRESO 50 WG
Product Use: Fungicide
Creation Date: September 2008
Revision Date: October 13

24 Hr Emergency Number: 082 771 2712
In case of Poisoning:
Poison Information Centre 082 446 8946
Tygerberg Hospital: (021) 931 6129
Poison Emergency Enquiries (021) 689 5227

SECTION 2 - COMPOSITION / INFORMATION ON INGREDIENTS

Common Name: kresoxim-methyl
Chemical Name: methyl (E)-methoxyimino [2-(o-tolyloxymethyl)phenyl]acetate (IUPAC)
CAS No.: [143390-89-0]
Chemical Family: strobilurin type; oximinoacetate
Chemical Formula: C_{18}H_{19}NO_{4}
Molecular weight: 313.4

Use: A fungicide with protective, curative, eradicative and long residual disease control. Inhibiting spore germination. A contact and translaminar fungicide for the control of certain fungal diseases on apples, citrus, cucurbits, grapes, mangoes, pears and roses.

Formulation: kresoxim-methyl: 500 g/kg
Water Dispersible Granule

Hazardous Ingredient:
Inert: Kresoxim-methyl 143390-89-0 > 50 %
Kaolin clay May act as an irritant to respiratory tract. Nuisance dust. ± 34 %
Other inerts not of concern ± 16 %

SYMBOLS: N
RISK-PHRASE(S): R20/22; R36, R40; R50/53

SECTION 3 - HAZARD IDENTIFICATION

Toxicity class: Slightly toxic.

Main Hazard:
No specific effects and/or symptoms have been reported or are known. May be a slight irritant to eyes after contact with eyes. May be harmful when ingested, possible generalized symptoms of poisoning include nausea and vomiting.

Environmental hazards:
Very toxic to fish and aquatic organisms. Kresoxim-methyl is non-toxic to earthworms, honeybees and mammals.

Effects and Symptoms:
No human poisoning was reported. An “interim determination of (3.05 x 10^{-3})” by the Cancer Peer Review Committee resulted that kresoxim-methyl is a class “C(q)” carcinogen. A definitive carcinogenicity classification for this product is still to be determined.

SECTION 4 - FIRST AID MEASURES AND PRECAUTIONS

Inhalation:
Immediately move patient to fresh air and keep warm and at rest. Obtain medical advice if necessary.
**Skin contact:**
Remove contaminated clothing, shoes and leather goods immediately. Gently wipe of excess chemical. Wash skin gently and thoroughly with clean water and non-abrasive soap or mild detergent until no evidence of chemical remains (approximately 15 to 20 minutes). Obtain medical advice if necessary.

**Eye contact:**
Flush eyes immediately with large amounts of gently flowing cold water, occasionally lifting upper and lower lids, until no evidence of chemical remains (approximately 15 to 20 minutes). If irritation persists, obtain medical advice.

**Ingestion:**
Do not induce vomiting. Obtain medical advice immediately for treatment advice and make the container, or label or this Data Sheet available.
Never give anything by mouth to a semi-conscious or unconscious person. If able to swallow, give person water to drink.

**Advice to physician:**
This product contains kresoxim-methyl and does not cause any definite symptoms that would be diagnostic.
There is no specific antidote available. Treat symptomatically and supportively.

### SECTION 5 - FIRE-FIGHTING MEASURES

**Flammable properties:**
Not flammable. May form an explosive dust/air mixture.

**Extinguishing agents:**
Extinguish fires with carbon dioxide, dry chemical, water spray or regular foam.
Avoid strong water jets or high-pressure water streams, as airborne dusts may be an explosive hazard. Water spray as a fog can be used for cooling of unaffected stock, but avoid water coming in contact with the product. Contain water used for fire-fighting for later disposal.
Avoid the accumulation of polluted run-off from the site.

**Fire fighting:**
Remove spectators from surrounding area. Remove container from fire area if possible without risk. This product is capable of dust explosion. Dust can form an explosive mixture with air. Prevent electrostatic charge. Eliminate all ignition sources in immediate area. Fight fire from maximum distance.
For massive fire, use unmanned hose holder or monitor nozzles. Contain fire control agents for later disposal. Use a recommended extinguishing agent for the type of surrounding fire. Avoid inhaling hazardous vapours. Keep upwind.
This product will emit toxic fumes, oxides of carbon or nitrogen when involved in a major fire.

**Personal protective equipment:**
Fire-fighters and others that may be exposed should wear full protective impervious clothing, including gloves and eye protection, and self-contained breathing apparatus. Contact with the fumes and vapours should be avoided by staying upwind.

### SECTION 6 - ACCIDENTAL RELEASE MEASURES (SPILLAGE)

**Personal precautions:**
Do not inhale fumes. Avoid contact with skin, eyes or clothes. Ventilate area of spill or leak, especially confined areas. For personal protection see Section 8.

**Environmental precautions:**
Do not allow entering drains or watercourses. Spillage or uncontrolled discharges into water courses (or public waters) to be reported immediately to the Police and to the Department of Water/Environmental Affairs.

**Occupational spill:**
Keep out unprotected persons and animals. Do not touch spilled material; stop leak if you can do it without risk.
Do not touch or walk through spilled material. Stop leak if possible without risk. Prevent dust cloud. Prevent product form entering sewers, water systems, basements or confined areas. Thoroughly wash body areas, which come into contact with the product.

**For spills:**
Use a clean shovel and place the material into a clean, dry container and cover for subsequent disposal. For large spills, cover powder spill with plastic sheet or tarpaulin to minimize spreading. In situations where product comes in contact with water, contain contaminated water for later disposal. Prevent material from spreading by damming in with absorptive material. Do not flush spilled material into drains. Keep spectators away and upwind.
Label drums with its content and dispose it in accordance with local regulations.
Open burning or dumping of this material is prohibited.

### SECTION 7 - HANDLING AND STORAGE REQUIREMENTS

**Handling:**
May be harmful if swallowed and a slight irritant to the eyes. Avoid contact with eyes and skin and inhalation of dust and fumes. Use with adequate ventilation. Wash hands before eating, drinking, chewing gum, smoking or using the toilet. Operators should change and wash clothing daily. Do not apply directly to areas where surface water is present, or to intertidal areas below the mean high water mark. Water used to clean equipment must be disposed of correctly to avoid contamination.
Storage:
Store in its original container in isolated, dry, cool (avoid temperatures above 40 °C) and well-ventilated area. Avoid cross contamination with other pesticides and fertilizers. Keep under lock and key out of reach of unauthorized persons, children and animals. Store away from incompatible substances. Not to be stored next to foodstuffs and water supplies. Local regulations should be complied with.

SECTION 8 - EXPOSURE CONTROL/PERSONAL PROTECTION

Engineering control measures:
It is essential to provide adequate ventilation. Ensure that control systems are properly designed and maintained. Comply with occupational safety, environmental, fire and other applicable regulations.

PERSONAL PROTECTIVE EQUIPMENT:
If engineering controls and work practices are not effective in controlling exposure to this material, then wear suitable personal equipment including approved respiratory protection.

Respirator:
When handling the product and when preparing the spray mixture, wear a face shield. It is usually safe to use the product without respirator. If the product is used in dusty or confined conditions or when in spillage and fire conditions, a respirator suitable for protection from dusts and mists of pesticides is adequate.

Clothing:
Employee must wear appropriate protective (impervious) clothing (long sleeved cotton overalls, apron, rubber boots and hat or cap) and equipment to prevent skin contact with the substance.

Gloves:
Employee must wear appropriate chemical resistant protective gloves (PVC or neoprene gloves) to prevent contact with this substance.

Eye protection:
Employee must wear splash-proof safety goggles and face-shield to prevent contact with this substance.

Emergency eye wash: Where there is any possibility that an employee's eyes may be exposed to this substance, the employer should provide an eye wash fountain or appropriate alternative within the immediate work area for emergency use.

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Free flowing off-white granules</td>
</tr>
<tr>
<td>Odour</td>
<td>Sulphur like odour.</td>
</tr>
<tr>
<td>Flash point</td>
<td>Not applicable. Not flammable.</td>
</tr>
<tr>
<td>Bulk density</td>
<td>1.16 ± 0.08 g/ℓ</td>
</tr>
<tr>
<td>Solubility in water</td>
<td>Dispersible.</td>
</tr>
<tr>
<td>pH</td>
<td>5 to 6</td>
</tr>
<tr>
<td>Explosive properties</td>
<td>May cause dust explosion.</td>
</tr>
</tbody>
</table>

SECTION 10 - STABILITY AND REACTIVITY

Storage stability:
Stable for up to 2 years under normal warehouse and field conditions. Avoid contact with strong oxidizing agents and strong bases. Protect the product from sunlight, open flame and sources of heat.

Stability:
Hydrolyses at pH >7. Hazardous polymerization will not occur. Product is not an oxidizer and is not corrosive to metal.

Hazardous decomposition:
Oxides of carbon or nitrogen evolve when involved in a major fire.

SECTION 11 - TOXICOLOGICAL INFORMATION

<table>
<thead>
<tr>
<th>Test</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute oral LD₅₀ rats</td>
<td>&gt; 5000 mg/kg</td>
</tr>
<tr>
<td>Acute dermal LD₅₀ rabbits</td>
<td>&gt; 2000 mg/kg</td>
</tr>
<tr>
<td>Inhalation LC₅₀ rats</td>
<td>&gt; 5 mg/ℓ (4hours)</td>
</tr>
<tr>
<td>Acute eye irritation</td>
<td>Slight irritant</td>
</tr>
<tr>
<td>Acute skin irritation</td>
<td>Non-irritant</td>
</tr>
</tbody>
</table>

Reproductivity: Kresoxim-methyl was administered in the diet of male and female rats for two generations. Animals were given test or control diet for at least 10 weeks. There were no dose- or treatment-related clinical signs of toxicity in the parental animals of either sex or generation. No treatment-related effects were observed on the reproductive performances of either generation.
Developmental toxicity: In a developmental toxicity study on rats, kresoxim-methyl was administered by gavage. No clinical signs of toxicity were observed in any treated animals during the study and no treatment-related gross abnormalities were observed at maternal necropsy.

Mutagenicity: Based on available studies, there are no concerns for mutagenicity at this time.

Carcinogenicity: An incidence of liver tumours was noted in long-term studies with kresoxim-methyl in rodents. As the mechanism involved is not relevant to humans, and the dose levels were very high, the potential carcinogenic risk to humans is considered negligible. The EPA has classified kresoxim-methyl as a class "C(q)" carcinogen.

ADI: 0.4 mg/kg/day.

SECTION 12 - ECOLOGICAL INFORMATION

Degradability:
Kresoxim-methyl breaks down rapidly in soil and water, with a half life of less than one day in soil and 1.2 days in aquatic environments. The substance has a low potential to leach in the field. Kresoxim-methyl was found to be very mobile in sand, loamy sand, loam, and clay soils; non-volatile in water and soil; and will accumulate in fish. BF 490-1, the major degradate, is expected to be more mobile than the parent compound and is expected to be more persistent. Therefore, it is believed that the impact of BF 490-1 on the environment is expected to be greater than the parent compound. The major routes of dissipation in the environment appear to be metabolism and leaching. The moderate octanol/water partition coefficient suggests that the chemical will have a tendency to accumulate in fish.

ECOTOXICOLOGY:

Birds: Practically non-toxic to birds.
Oral LD₅₀: Quail: > 2150 mg/kg
LC₅₀ (8 days): Bobwhite quail: > 5000 ppm
Mallard duck: > 5000 ppm

Fish: Very toxic to fish.
LC₅₀ (96 hours): Bluegill sunfish: 0.499 mg/ℓ
Rainbow trout: 190 ppb

Daphnia: Very toxic.
EC₅₀ (48 hours): Daphnia magna 0.186 mg/ℓ

Bees: Relatively non toxic.
LD₅₀ (48 hours): oral & contact: > 20 µg/bee

Algae:
EC₅₀ (72 hours): Ankistrodesmus brahaianus 63 µg/ℓ

Earthworms:
LC₅₀: Eisenia fetida > 937 mg/kg dry soil.

SECTION 13 - DISPOSAL CONSIDERATION

Pesticide disposal:
Open dumping or burning of this pesticide is prohibited. Waste resulting from the use of this product that cannot be reused or reprocessed should be disposed of in a landfill approved for pesticide disposal. Do not contaminate rivers, dams or any other water sources with the product or used containers. Never pour untreated waste or surplus products into public sewers or where there is any danger of run-off or seepage into water systems. Comply with local legislation applying to waste disposal.

Package product wastes:
Emptied containers retain vapour and product residues. Observe all labelled safeguards. Containers and packages must be completely emptied before being disposed of. Shake out thoroughly into the mixing tank and destroy the empty container thereafter. Destroy the empty container by perforation and burying it.

Never re-use the empty container for any other purpose. Do not burn the empty container. Refer to label attached.
Comply with any local legislation applying to disposal.

SECTION 14 - TRANSPORT INFORMATION

UN NUMBER: 3077
Road Transport ADR/RID:
Class: 9
Packaging group: III
Shipping name: Environmental Hazardous Substance, Solid, N.O.S. (kresoxim-methyl 500 g/kg)

Maritime Transport IMDG/IMO:
Class: 9
Packaging group: III
Shipping name: Environmental Hazardous Substance, Solid, N.O.S. (kresoxim-methyl 500 g/kg)

Considered a MARINE POLLUTANT.

MATERIAL SAFETY DATA SHEET

Issued by: Arysta Lifescience South Africa Phone: 031 514 5600
Poison Information Centre: 082 446 8946; Tygerberg: (021) 931 6129; Poison Emergency Enquiry: (021) 689 5227
SECTION 15 - REGULATORY INFORMATION

Symbol: N
Indication of Danger: Environmentally dangerous substance

Risk phrases:
- R 20/22 Harmful by inhalation and if swallowed.
- R 36 Irritating to eyes.
- R 40 Limited evidence of a carcinogenic effect.
- R 50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety phrases:
- S 1/2 Keep locked up and out of reach of children.
- S 24/25 Avoid contact with skin and eyes.
- S 36/37/39 Wear suitable protective clothing, gloves and eye/face protection.
- S 60 This material and its container must be disposed of as hazardous waste.
- S 61 Avoid release to the environment. Refer to special instructions / Safety data sheets.

SECTION 16 - OTHER INFORMATION

Packing and Labelling
Packed in 500 g plastic containers, and labelled according to the South African regulations and guidelines.

Disclaimer:
The information on this sheet is not a specification; it does not guarantee specific properties. The information is intended to provide general guidance as to health and safety based upon our knowledge of the handling, storage use of the product. It is not applicable to unusual or non-standard uses of the product or where instructions or recommendations are not followed.

All information is given in good faith but without guarantee in respect of accuracy, and no responsibility is accepted for errors and omissions or the consequence thereof.