SECTION 1: IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND THE COMPANY/UNDERTAKING

1.1 Product Identifier

Product Name: Ziram
Synonym: Zinc dimethyldithiocarbamate

1.2 Use of the Substance/Mixture

Identified uses: Fungicide

1.3 Manufacturer or supplier’s details

Company/Undertaking identification address:
Merchem Limited
Grove Centre,
44- Development Plot,
Kalamassery,
Cochin – 683 109, Kerala, India
Telephone: + 91-484-4089300
Telefax: + 91-484-4089310

1.4 Emergency Telephone Number

Emergency Telephone Number: + 91-484-4089300

SECTION 2: HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

Classification according to EU directives 67/548/EEC or 1999/45/EC

T+
Xn
Xi
N
R50/53
R26
R22
R48/22
R37
R41
R43

EC Number: 205-288-3
Annex 1 Index Number: 006-012-00-2
SAFETY DATA SHEET

REGULATION (EC) No. 1272/2008

Classification of the substance or mixture

Acute tox: Cat. 2; Acute tox: Cat. 4; STOT RE: Cat. 2; STOT Se: Cat. 3; Eye damage: Cat 1; Skin sensitization: Cat. 1; Aquatic acute: Cat. 1; Aquatic Chronic: Cat. 1; M-factor: 100

2.2 Label elements

Product Name
ZIRAM

Hazard pictograms

Signal Word
Danger

Hazard Statements
H330 - Fatal if inhaled
H302 - Harmful if swallowed
H373 - May cause damage to organs through prolonged or repeated exposure
H335 - May cause respiratory irritation
H318 - Causes serious eye damage
H317 - May cause an allergic skin reaction
H410 - Very toxic to aquatic life with long lasting effects

Precautionary statement – Prevention
P264 - Wash face, hands and any exposed skin thoroughly after handling
P270 - Do not eat, drink or smoke when using this product
P260 - Do not breathe dust/ fume/ gas /mist/ vapors/spray
P271 - Use only outdoors or in a well-ventilated area
P284 - Wear respiratory protection
P261 - Avoid breathing dust/fume/gas/mist/vapors/spray
P280 - Wear protective gloves/protective clothing/eye protection/face protection
P273 - Avoid release to the environment

Precautionary statement – Response
P301+312 - IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell
P330 - Rinse mouth
P304 + P340 - IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing
P310 - Immediately call a POISON CENTER or doctor/physician
P320 - Specific treatment is urgent (see supplemental first aid instructions on this label)
P302 + P352 - IF ON SKIN: Wash with plenty of soap and water
P333 + P313 - If skin irritation or rash occurs: Get medical advice/attention
P321 - Specific treatment (see supplemental first aid instructions on this label)
P363 - Wash contaminated clothing before reuse
P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P314 - Get medical advice/attention if you feel unwell
P391 - Collect spillage
P312 - Call a POISON CENTER or doctor/physician if you feel unwell

Precautionary statement – Storage
P403 + P233 - Store in a well-ventilated place. Keep container tightly closed
P405 - Store locked up

Precautionary statement – disposal
- P501 - Dispose of contents/container to an approved incineration plant

2.3 Other hazards

PBT and vPvB assessment
This substance is not considered to be persistent, bioaccumulating nor toxic (PBT)
This substance is not considered to be very persistent nor very bioaccumulating (vPvB)

Other hazards which do not result in classification
Risk of dust explosion
Use of alcoholic beverages may enhance toxic effects

For the full text of the R phrases, S phrases, and symbols mentioned in this Section, see Section 16

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Chemical description: Zinc dimethyldithiocarbamate

Composition/Information on ingredients

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS No.</th>
<th>EC No.</th>
<th>Annex-1 Index No.</th>
<th>Weight %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zinc Dimethyl dithio carbamate</td>
<td>137-30-4</td>
<td>205-288-3</td>
<td>006-012-00-2</td>
<td>&gt;96</td>
</tr>
</tbody>
</table>

3.2 Mixtures

Not applicable. Substance is not a mixture
4.1 Description of first-aid measures

**General Advice**
If symptoms persist, call a physician. Show this material safety data sheet to the doctor in attendance. Treat symptomatically. Use of alcoholic beverages may enhance toxic effects. In case of allergic reaction after exposure, any future exposure must be avoided.

**Eye Contact**
Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Remove contact lenses. Obtain medical attention.

**Skin Contact**
Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes. Thoroughly clean shoes before reuse. If skin irritation persists, call a physician.

**Inhalation**
Remove from exposure, lie down. Move to fresh air. If breathing is difficult, give oxygen. Immediate medical attention is required.

**Ingestion**
Clean mouth with water and afterwards drink plenty of water. Do not induce vomiting. Treat symptomatically. If swallowed, seek medical advice immediately and show this container or label. Loosen tight clothing such as collar, tie, belt and waistband.

4.2 Most important symptoms and effects, both acute and delayed

- May be fatal if inhaled in large quantities
- Toxic if swallowed
- Serious eye damage/eye irritation
- Irritating to respiratory system
- May cause sensitization by skin contact
- Dermal absorption possible
- Liver and kidney injuries may occur
- Symptoms and signs include headache, dizziness, fatigue, muscular weakness, drowsiness and in extreme cases, loss of consciousness.

4.3 Indication of immediate medical attention and special treatment needed

- General advice for dithiocarbamates
- Biomonitoring possible at chronical exposure: determination of TTCA in the urine at the end of the workday/week.
- Blood testing for delayed effects: liver tests, kidney function, thyroid function
SECTION 5: FIRE FIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media: Water spray/mist, foam, dry chemical powder

Extinguishing media which must not be used for safety reasons: High volume water jet

5.2 Specific hazards arising from the substance or mixture

Specific hazards
- Combustible material
- Dust may form explosive mixture in air
- Heating can release hazardous gases:
  - Carbon monoxide
  - Sulphur oxides
  - Nitrogen oxides (NOx)

Specific methods
- Cool containers / tanks with water spray
- Keep product and empty container away from heat and sources of ignition
- Do not flush into surface water or sanitary sewer system
- Prevent product from entering drains
- Collect contaminated fire extinguishing water separately. This must not be discharged into drains

5.3 Protective Equipment and Precautions for Firefighters

Wear full protective clothing and self-contained breathing apparatus

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

- Avoid contact with skin, eyes and clothing
- Evacuate personnel to safe areas
- Keep people away from and upwind of spill/leak
- Wear respiratory protection
- Wear suitable protective clothing, gloves and eye/face protection

6.2 Environmental precautions

- Remove immediately adhering matter
- Prevent product from entering drains
- Do not flush into surface water or sanitary sewer system
6.3 Methods and materials for containment and cleaning up

- Absorb spill with inert material (e.g. dry sand or earth), then place in a chemical waste container
- Do not flush with water
- Avoid dust formation
- Use a suitable vacuum cleaner
- Use explosion-proof equipment

6.4 Reference to other sections

See section 7, 8 and 13

SECTION 7: HANDLING AND STORAGE

7.1 Precautions for safe handling

- Take measures to prevent the build-up of electrostatic charge
- Use only in area provided with appropriate exhaust ventilation
- Use spark-proof tools and explosion-proof equipment
- Avoid dust formation
- Avoid contact with skin, eyes and clothing
- Wear personal protective equipment
- Do not breathe vapours/dust
- Use only in an area equipped with a safety shower
- Ensure that eyewash stations and safety showers are close to the workstation location
- Do not eat, drink or smoke when using this product
- Wash hands after handling
- Remove contaminated clothing and protective equipment before entering eating areas

7.2 Conditions for safe storage, including any incompatibilities

- In accordance with local and national regulations
- Keep in a dry, cool place
- Do not store near acids
- Do not store together with oxidizing and self-igniting products
- Use spark-proof tools and explosion-proof equipment
- Keep away from heat and sources of ignition

7.3 Specific end uses

No further relevant information available.
SECTION 8: EXPOSURE CONTROL/PERSONNEL PROTECTION

8.1 Control parameters

Occupational exposure limit values: No data available

8.2 Exposure controls

Engineering Controls: Avoid dust generation. Ensure good ventilation and Local exhaustion of the working area

Personal Protective Equipment:

Eye/face Protection: Tightly fitting safety goggles or Face-shield

Skin Protection: Wear suitable protective clothing/equipment

Hand Protection: The selected protective gloves have to satisfy the specifications of EU Directive 89/689/EEC and the standard EN 374 derived from it. The suitability for a specific workplace should be discussed with the producers of the protective gloves

Respiratory Protection: In accordance with local and national regulations
- In case of insufficient ventilation, wear suitable respiratory equipment
- Suitable mask with particle filter P3 (European Norm 143)
- Self-contained breathing apparatus (EN 133)
  (in case of higher concentration)

Environmental exposure controls: Prevent product from entering drains
- Do not contaminate surface water
- Avoid subsoil penetration
9.1 Information on basic physical and chemical properties

- **Physical State**: Solid powder
- **Color**: White
- **Odor**: None
- **Boiling point/Range**: Not applicable
- **Melting point/Range**: 240°C
- **Flash Point**: Approximately 200°C
- **Auto-ignition temperature**: 400°C
- **Explosive properties**: Dust explosion hazard
- **Explosion Limit**: Lower explosion Limit (LEL): 40g/m3
  Minimum ignition energy: <=10 mJ
- **Oxidizing properties**: No data available
- **Vapor pressure**: Negligible at room temperature
- **Density**: 1700 Kg/M3 at 20°C
- **Bulk density**: 330 – 370 Kg/M3
- **Solubility in water**: Practically insoluble
- **Solubility in other solvents**: Acetone, alcohol, benzene
- **pH**: No data available
- **Partition coefficient (n-Octanol-water)**: No data available
- **Relative vapor density**: No data available
- **Viscosity**: No data available

9.2 Other information

No data available

SECTION 10: STABILITY AND REACTIVITY

10.1 Reactivity

- See Incompatible Materials

10.2 Chemical Stability

- Stable under recommended storage and handling conditions (See section 7)

10.3 Possibility of hazardous reactions

- See Incompatible Materials
10.4 Conditions to Avoid

- Avoid dust formation
- Keep away from heat and sources of ignition
- Take precautionary measures against static discharges

10.5 Incompatible materials to avoid

- Strong acids
- Oxidizing agents

10.6 Hazardous Decomposition Products

- Heating or fire can release toxic gas
  Carbon oxides
  Nitrogen oxides (NOx)
  Sulphur oxides

SECTION 11: TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

<table>
<thead>
<tr>
<th>Toxicological Effect</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute oral toxicity (LD50/oral/rat):</td>
<td>267 mg/Kg</td>
</tr>
<tr>
<td>Acute dermal toxicity (LD50/dermal/rat):</td>
<td>2000 mg/Kg</td>
</tr>
<tr>
<td>Acute inhalational toxicity (LC50/inhalation/4h/rat):</td>
<td>0.06 mg/L</td>
</tr>
<tr>
<td>Eye irritation:</td>
<td>Irritating to eyes</td>
</tr>
<tr>
<td>Skin irritation/Sensitization:</td>
<td>Non-irritating to the skin</td>
</tr>
<tr>
<td>Mutagenic Effects:</td>
<td>Did not show mutagenic effects in animal experiments</td>
</tr>
<tr>
<td>Reproductive toxicity:</td>
<td>No toxicity to reproduction</td>
</tr>
<tr>
<td>Carcinogenic effects:</td>
<td>Did not show carcinogenic effects in animal experiments</td>
</tr>
<tr>
<td>Target Organ Effects:</td>
<td>Kidney, Lever, Stomach, thyroid, adrenal gland, nervous system, muscle</td>
</tr>
<tr>
<td>Human experience:</td>
<td>May cause cardiac arrhythmia, dizziness, Fatigue, headache, eczema, dermatitis, nausea, muscular weakness, Shortness of breath, Drowsiness, More severe effects if alcohol is consumed, in extreme cases</td>
</tr>
</tbody>
</table>
SECTION 12: ECOLOGICAL INFORMATION

12.1 Ecotoxicity

Component information: Active ingredient
Toxicity to fish: LC50: 0.0097 - 1.70 mg/L
EC50/48h/daphnia: 0.048 mg/l
EC50/120h/algae: 0.066 mg/l
Toxicity to bacteria: IC50: 19.20 mg/l

12.2 Mobility in soil

Minimum

12.3 Persistence and degradability

Degradation half life after <2 days

12.4 Bioaccumulative Potential

Minimum

12.5 Results of PBT and vPvB assessment

• This substance is not considered to be persistent, bioaccumulating nor toxic (PBT)
• This substance is not considered to be very persistent nor very bioaccumulating (vPvB)

12.6 Other adverse effects

None known based on information supplied

12.7 Other information

Do not discharge product unmonitored into the environment

SECTION 13: DISPOSAL CONSIDERATIONS

13.1 Waste Disposal Method

Product
• Dispose of in accordance with local regulations
• Waste codes should be assigned by the user based on the application for which the product was used
• Classified as hazardous waste according to national equivalent of EC-Dir. 91/689; disposal of toxic and hazardous waste

Packing
• Empty containers should be taken for local recycling, recovery or waste disposal
SECTION 14: TRANSPORT INFORMATION

14.1 Road transport (ADR/RID/ADN)
ADR/RID Class 6.1
UN-No 2811
Packing Group I
Proper Shipping Name Toxic solid, organic, N.O.S. (Zinc dimethyldithiocarbamate)

14.2 Sea transport (IMDG)
Class 6.1
UN-No 2811
Packing Group I
Marine pollutant Yes
Proper Shipping Name Toxic solid, organic, N.O.S. (Zinc dimethyldithiocarbamate)

14.3 Air transport (ICAO-TI/IATA)
Class 6.1
UN-No 2811
Packing Group I
Proper Shipping Name Toxic solid, organic, N.O.S. (Zinc dimethyldithiocarbamate)

14.4 Other information
No data available

14.5 Environmental hazards
Information on environmental hazards, if relevant, pls. see 14.1 - 14.3.

14.6 Special precautions for user
No data available

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
Not relevant

SECTION 15: REGULATORY INFORMATION

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture
Regulation 1907/2006 REGULATION (EC) No 1272/2008
Classification according to EU directives 67/548/EEC or 1999/45/EC

15.2 Chemical Safety Assessment
No data available
SECTION 16: OTHER INFORMATION

List of relevant R(isk)-phrase(s)

- R22 - Harmful if swallowed
- R48/22 - Harmful: danger of serious damage to health by prolonged exposure if swallowed
- R26 - Very toxic by inhalation
- R37 - Irritating to respiratory system
- R41 - Risk of serious damage to eyes
- R43 - May cause sensitization by skin contact
- R50/53 - Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment

List of relevant S(afety) phrase(s)

- S20 - Do not breathe dust
- S26 - In case of contact with eyes, rinse immediately with plenty of water and seek medical advice
- S28 - After contact with skin, wash immediately with plenty of soap and water
- S36/37/39 – Wear suitable protective clothing, gloves and eye/-face protection
- S45 - In case of accident or in case you feel unwell, seek medical advice immediately
- S60 - This material and its container must be disposed of as hazardous waste
- S61 - Avoid release to the environment. Refer to special instructions/safety data sheets

Classification of dangerous substance directive (67/548/EEC)

- T+ - Toxic substances or preparations, classified as very toxic (T+) or toxic (T)
- Xn - Harmful substances or preparations
- Xi - Irritants
- N - Substances or preparations those are dangerous for the environment

Training advice

Provide adequate information, instruction and training to operators

Further information for the material safety data sheet

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release.

End of Material Safety Data Sheet