

**Ivermectin Liquid Formulation**

|         |                |               |                                 |
|---------|----------------|---------------|---------------------------------|
| Version | Revision Date: | SDS Number:   | Date of last issue: 06.07.2024  |
| 8.1     | 03.02.2025     | 1204378-00026 | Date of first issue: 09.01.2017 |

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**Section 1: Identification**

**Product identifier** : Ivermectin Liquid Formulation

**Recommended use of the chemical and restrictions on use**

Recommended use : Veterinary product  
Restrictions on use : Not applicable

**Manufacturer or supplier's details**

Company : MSD  
Address : 50 Tuas West Drive  
Singapore - Singapore 638408  
Telephone : +1-908-740-4000  
Emergency telephone number : 65 6697 2111 (24/7/365)  
E-mail address : EHSDATASTEWARD@msd.com

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**Section 2: Hazard identification****Classification of the substance or mixture**

Skin corrosion/irritation : Category 2  
Serious eye damage/eye irritation : Category 2  
Reproductive toxicity : Category 1B  
Specific target organ toxicity - single exposure (Oral) : Category 2 (Central nervous system)  
Specific target organ toxicity - single exposure : Category 3  
Specific target organ toxicity - repeated exposure (Oral) : Category 2 (Central nervous system)  
Short-term (acute) aquatic hazard : Category 1  
Long-term (chronic) aquatic hazard : Category 1

**GHS Label elements, including precautionary statements**

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Hazard pictograms :   

Signal word : Danger

Hazard statements : H315 Causes skin irritation.  
H319 Causes serious eye irritation.  
H335 May cause respiratory irritation.  
H360D May damage the unborn child.  
H371 May cause damage to organs (Central nervous system) if swallowed.  
H373 May cause damage to organs (Central nervous system) through prolonged or repeated exposure if swallowed.  
H410 Very toxic to aquatic life with long lasting effects.

Precautionary statements : **Prevention:**  
P201 Obtain special instructions before use.  
P202 Do not handle until all safety precautions have been read and understood.  
P260 Do not breathe mist or vapours.  
P264 Wash skin thoroughly after handling.  
P270 Do not eat, drink or smoke when using this product.  
P271 Use only outdoors or in a well-ventilated area.  
P273 Avoid release to the environment.  
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection/ hearing protection.

**Response:**  
P302 + P352 IF ON SKIN: Wash with plenty of water.  
P304 + P340 + P312 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/ doctor if you feel unwell.  
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.  
P308 + P311 IF exposed or concerned: Call a POISON CENTER/ doctor.  
P332 + P313 If skin irritation occurs: Get medical advice/ attention.  
P337 + P313 If eye irritation persists: Get medical advice/ attention.  
P391 Collect spillage.

**Storage:**  
P405 Store locked up.

**Disposal:**  
P501 Dispose of contents/ container to an approved waste disposal plant.

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**Other hazards which do not result in classification**

None known.

**Section 3: Composition/information on ingredients**

Substance / Mixture : Mixture

**Components**

| Chemical name          | CAS-No.    | Concentration (% w/w) |
|------------------------|------------|-----------------------|
| N-Methyl-2-pyrrolidone | 872-50-4   | $\geq 10$ - $< 20$    |
| Ivermectin             | 70288-86-7 | $\geq 1$ - $< 2.5$    |

**Section 4: First-aid measures****Description of necessary first-aid measures**

- General advice : In the case of accident or if you feel unwell, seek medical advice immediately.  
When symptoms persist or in all cases of doubt seek medical advice.
- If inhaled : If inhaled, remove to fresh air.  
Get medical attention.
- In case of skin contact : In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.  
Get medical attention.  
Wash clothing before reuse.  
Thoroughly clean shoes before reuse.
- In case of eye contact : In case of contact, immediately flush eyes with plenty of water for at least 15 minutes.  
If easy to do, remove contact lens, if worn.  
Get medical attention.
- If swallowed : If swallowed, DO NOT induce vomiting.  
Get medical attention.  
Rinse mouth thoroughly with water.  
Never give anything by mouth to an unconscious person.

**Most important symptoms and effects, both acute and delayed**

- Risks : Causes skin irritation.  
Causes serious eye irritation.  
May cause respiratory irritation.  
May damage the unborn child.  
May cause damage to organs if swallowed.  
May cause damage to organs through prolonged or repeated exposure if swallowed.
- Protection of first-aiders : First Aid responders should pay attention to self-protection, and use the recommended personal protective equipment when the potential for exposure exists (see section 8).

**Indication of any immediate medical attention and special treatment needed**

- Treatment : Treat symptomatically and supportively.

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**Section 5: Fire-fighting measures****Extinguishing media**

Suitable extinguishing media : Water spray  
Alcohol-resistant foam  
Carbon dioxide (CO<sub>2</sub>)  
Dry chemical

Unsuitable extinguishing media : None known.

**Special hazards arising from the substance or mixture**

Specific hazards during fire-fighting : Exposure to combustion products may be a hazard to health.

Hazardous combustion products : Carbon oxides  
Nitrogen oxides (NO<sub>x</sub>)

**Special protective actions for fire-fighters**

Special protective equipment for firefighters : In the event of fire, wear self-contained breathing apparatus.  
Use personal protective equipment.

Specific extinguishing methods : Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.  
Use water spray to cool unopened containers.  
Remove undamaged containers from fire area if it is safe to do so.  
Evacuate area.

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**Section 6: Accidental release measures****Personal precautions, protective equipment and emergency procedures**

Personal precautions : Use personal protective equipment.  
Follow safe handling advice (see section 7) and personal protective equipment recommendations (see section 8).

**Environmental precautions**

Environmental precautions : Avoid release to the environment.  
Prevent further leakage or spillage if safe to do so.  
Prevent spreading over a wide area (e.g. by containment or oil barriers).  
Retain and dispose of contaminated wash water.  
Local authorities should be advised if significant spillages cannot be contained.

**Methods and materials for containment and cleaning up**

Methods for cleaning up : Soak up with inert absorbent material.  
For large spills, provide dyking or other appropriate containment to keep material from spreading. If dyked material can

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be pumped, store recovered material in appropriate container. Clean up remaining materials from spill with suitable absorbent.

Local or national regulations may apply to releases and disposal of this material, as well as those materials and items employed in the cleanup of releases. You will need to determine which regulations are applicable.

Sections 13 and 15 of this SDS provide information regarding certain local or national requirements.

**Section 7: Handling and storage****Precautions for safe handling**

- Technical measures : See Engineering measures under EXPOSURE CONTROLS/PERSONAL PROTECTION section.
- Local/Total ventilation : If sufficient ventilation is unavailable, use with local exhaust ventilation.
- Advice on safe handling : Do not get on skin or clothing.  
Do not breathe mist or vapours.  
Do not swallow.  
Do not get in eyes.  
Wash skin thoroughly after handling.  
Handle in accordance with good industrial hygiene and safety practice, based on the results of the workplace exposure assessment  
Keep container tightly closed.  
Already sensitised individuals, and those susceptible to asthma, allergies, chronic or recurrent respiratory disease, should consult their physician regarding working with respiratory irritants or sensitisers.  
Do not eat, drink or smoke when using this product.  
Take care to prevent spills, waste and minimize release to the environment.
- Hygiene measures : If exposure to chemical is likely during typical use, provide eye flushing systems and safety showers close to the working place.  
When using do not eat, drink or smoke.  
Wash contaminated clothing before re-use.  
The effective operation of a facility should include review of engineering controls, proper personal protective equipment, appropriate degowning and decontamination procedures, industrial hygiene monitoring, medical surveillance and the use of administrative controls.

**Conditions for safe storage, including any incompatibilities**

- Conditions for safe storage : Keep in properly labelled containers.  
Store locked up.  
Keep tightly closed.  
Keep in a cool, well-ventilated place.  
Store in accordance with the particular national regulations.
- Materials to avoid : Do not store with the following product types:

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Strong oxidizing agents

## Section 8: Exposure controls/personal protection

## Control parameters

## Occupational Exposure Limits

| Components                | CAS-No.    | Value type<br>(Form of exposure) | Control parameters / Permissible concentration | Basis    |
|---------------------------|------------|----------------------------------|------------------------------------------------|----------|
| Ivermectin                | 70288-86-7 | TWA                              | 30 µg/m <sup>3</sup> (OEB 3)                   | Internal |
| Further information: Skin |            |                                  |                                                |          |
|                           |            | Wipe limit                       | 300 µg/100 cm <sup>2</sup>                     | Internal |

## Biological occupational exposure limits

| Components             | CAS-No.  | Control parameters               | Biological specimen | Sampling time                                            | Permissible concentration | Basis     |
|------------------------|----------|----------------------------------|---------------------|----------------------------------------------------------|---------------------------|-----------|
| N-Methyl-2-pyrrolidone | 872-50-4 | 5-Hydroxy-N-methyl-2-pyrrolidone | Urine               | End of shift (As soon as possible after exposure ceases) | 100 mg/l                  | ACGIH BEI |

## Appropriate engineering control measures

: Use appropriate engineering controls and manufacturing technologies to control airborne concentrations (e.g., drip-less quick connections).  
 All engineering controls should be implemented by facility design and operated in accordance with GMP principles to protect products, workers, and the environment.  
 Containment technologies suitable for controlling compounds are required to control at source and to prevent migration of the compound to uncontrolled areas (e.g., open-face containment devices).  
 Minimize open handling.

## Individual protection measures, such as personal protective equipment (PPE)

Eye/face protection : Wear safety glasses with side shields or goggles.  
 If the work environment or activity involves dusty conditions, mists or aerosols, wear the appropriate goggles.  
 Wear a faceshield or other full face protection if there is a potential for direct contact to the face with dusts, mists, or aerosols.

Skin protection : Work uniform or laboratory coat.  
 Additional body garments should be used based upon the task being performed (e.g., sleevelets, apron, gauntlets, disposable suits) to avoid exposed skin surfaces.

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|                        |   |                                                                                                                                                                                                                                                           |
|------------------------|---|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Respiratory protection | : | Use appropriate degowning techniques to remove potentially contaminated clothing.<br>If adequate local exhaust ventilation is not available or exposure assessment demonstrates exposures outside the recommended guidelines, use respiratory protection. |
| Filter type            | : | Combined particulates and organic vapour type                                                                                                                                                                                                             |
| Hand protection        | : |                                                                                                                                                                                                                                                           |
| Material               | : | Chemical-resistant gloves                                                                                                                                                                                                                                 |
| Remarks                | : | Consider double gloving.                                                                                                                                                                                                                                  |

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**Section 9: Physical and chemical properties**

|                                                  |   |                               |
|--------------------------------------------------|---|-------------------------------|
| Appearance                                       | : | liquid                        |
| Colour                                           | : | light yellow                  |
| Odour                                            | : | characteristic                |
| Odour Threshold                                  | : | No data available             |
| pH                                               | : | No data available             |
| Melting point/freezing point                     | : | No data available             |
| Initial boiling point and boiling range          | : | No data available             |
| Flash point                                      | : | > 100 °C                      |
| Evaporation rate                                 | : | No data available             |
| Flammability (solid, gas)                        | : | Not applicable                |
| Flammability (liquids)                           | : | No data available             |
| Upper explosion limit / Upper flammability limit | : | No data available             |
| Lower explosion limit / Lower flammability limit | : | No data available             |
| Vapour pressure                                  | : | No data available             |
| Relative vapour density                          | : | No data available             |
| Relative density                                 | : | No data available             |
| Density                                          | : | 0.90 - 0.92 g/cm <sup>3</sup> |
| Solubility(ies)                                  | : |                               |

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|                                        |   |                                                          |
|----------------------------------------|---|----------------------------------------------------------|
| Water solubility                       | : | insoluble                                                |
| Partition coefficient: n-octanol/water | : | Not applicable                                           |
| Auto-ignition temperature              | : | No data available                                        |
| Decomposition temperature              | : | No data available                                        |
| Viscosity                              | : |                                                          |
| Viscosity, kinematic                   | : | No data available                                        |
| Explosive properties                   | : | Not explosive                                            |
| Oxidizing properties                   | : | The substance or mixture is not classified as oxidizing. |
| Molecular weight                       | : | No data available                                        |
| Particle characteristics               | : |                                                          |
| Particle size                          | : | Not applicable                                           |

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**Section 10: Stability and reactivity**

|                                    |   |                                                |
|------------------------------------|---|------------------------------------------------|
| Reactivity                         | : | Not classified as a reactivity hazard.         |
| Chemical stability                 | : | Stable under normal conditions.                |
| Possibility of hazardous reactions | : | Can react with strong oxidizing agents.        |
| Conditions to avoid                | : | None known.                                    |
| Incompatible materials             | : | Oxidizing agents                               |
| Hazardous decomposition products   | : | No hazardous decomposition products are known. |

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**Section 11: Toxicological information**

|                                          |   |                                                        |
|------------------------------------------|---|--------------------------------------------------------|
| Information on likely routes of exposure | : | Inhalation<br>Skin contact<br>Ingestion<br>Eye contact |
|------------------------------------------|---|--------------------------------------------------------|

**Acute toxicity**

Not classified based on available information.

**Product:**

|                       |   |                                                                      |
|-----------------------|---|----------------------------------------------------------------------|
| Acute oral toxicity   | : | Acute toxicity estimate: > 2,000 mg/kg<br>Method: Calculation method |
| Acute dermal toxicity | : | Acute toxicity estimate: > 2,000 mg/kg<br>Method: Calculation method |

**Components:****N-Methyl-2-pyrrolidone:**

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Acute oral toxicity : LD50 (Rat): 4,150 mg/kg  
Method: OECD Test Guideline 401  
Remarks: The test was conducted equivalent or similar to guideline

Acute inhalation toxicity : LC50 (Rat): > 5.1 mg/l  
Exposure time: 4 h  
Test atmosphere: dust/mist  
Method: OECD Test Guideline 403  
Remarks: The test was conducted according to guideline

Acute dermal toxicity : LD50 (Rat): > 5,000 mg/kg  
Method: OECD Test Guideline 402  
Remarks: The test was conducted equivalent or similar to guideline

**Ivermectin:**

Acute oral toxicity : LD50 (Rat): 50 mg/kg  
  
LD50 (Mouse): 25 mg/kg  
  
LD50 (Monkey): > 24 mg/kg  
Target Organs: Central nervous system  
Symptoms: Vomiting, Dilatation of the pupil  
Remarks: No mortality observed at this dose.

Acute inhalation toxicity : LC50 (Rat): 5.11 mg/l  
Exposure time: 1 h  
Test atmosphere: dust/mist

Acute dermal toxicity : LD50 (Rabbit): 406 mg/kg  
  
LD50 (Rat): > 660 mg/kg

**Skin corrosion/irritation**

Causes skin irritation.

**Components:****N-Methyl-2-pyrrolidone:**

Species : Rabbit  
Method : OECD Test Guideline 404  
Result : Skin irritation  
Remarks : The test was conducted equivalent or similar to guideline

**Ivermectin:**

Species : Rabbit  
Result : No skin irritation

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**Serious eye damage/eye irritation**

Causes serious eye irritation.

**Components:****N-Methyl-2-pyrrolidone:**

|         |   |                                                           |
|---------|---|-----------------------------------------------------------|
| Species | : | Rabbit                                                    |
| Result  | : | Irritation to eyes, reversing within 21 days              |
| Method  | : | OECD Test Guideline 405                                   |
| Remarks | : | The test was conducted equivalent or similar to guideline |

**Ivermectin:**

|         |   |                     |
|---------|---|---------------------|
| Species | : | Rabbit              |
| Result  | : | Mild eye irritation |

**Respiratory or skin sensitisation****Skin sensitisation**

Not classified based on available information.

**Respiratory sensitisation**

Not classified based on available information.

**Components:****N-Methyl-2-pyrrolidone:**

|                 |   |                                      |
|-----------------|---|--------------------------------------|
| Test Type       | : | Local lymph node assay (LLNA)        |
| Exposure routes | : | Skin contact                         |
| Species         | : | Mouse                                |
| Method          | : | OECD Test Guideline 429              |
| Result          | : | negative                             |
| Remarks         | : | Based on data from similar materials |

**Ivermectin:**

|                 |   |                                    |
|-----------------|---|------------------------------------|
| Exposure routes | : | Dermal                             |
| Species         | : | Humans                             |
| Result          | : | Does not cause skin sensitisation. |

**Germ cell mutagenicity**

Not classified based on available information.

**Components:****N-Methyl-2-pyrrolidone:**

|                       |   |                                                                                                                                                                     |
|-----------------------|---|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Genotoxicity in vitro | : | Test Type: Bacterial reverse mutation assay (AMES)<br>Method: OECD Test Guideline 471<br>Result: negative<br>Remarks: The test was conducted according to guideline |
|                       |   | Test Type: In vitro mammalian cell gene mutation test<br>Method: OECD Test Guideline 476                                                                            |

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Result: negative  
Remarks: The test was conducted according to guideline

Test Type: DNA damage and repair, unscheduled DNA synthesis in mammalian cells (in vitro)  
Method: OECD Test Guideline 482  
Result: negative  
Remarks: The test was conducted equivalent or similar to guideline

Genotoxicity in vivo : Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay)  
Species: Mouse  
Application Route: Ingestion  
Method: OECD Test Guideline 474  
Result: negative  
Remarks: The test was conducted according to guideline

**Ivermectin:**

Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)  
Result: negative

Test Type: DNA damage and repair, unscheduled DNA synthesis in mammalian cells (in vitro)  
Test system: human diploid fibroblasts  
Result: negative

Test Type: Mouse Lymphoma  
Result: negative

**Carcinogenicity**

Not classified based on available information.

**Components:****N-Methyl-2-pyrrolidone:**

Species : Rat  
Application Route : Ingestion  
Exposure time : 2 Years  
Method : OECD Test Guideline 451  
Result : negative  
Remarks : The test was conducted according to guideline

Species : Rat  
Application Route : Inhalation  
Exposure time : 2 Years  
Method : OECD Test Guideline 453  
Result : negative  
Remarks : The test was conducted equivalent or similar to guideline

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**Ivermectin:**

|                   |                                        |
|-------------------|----------------------------------------|
| Species           | : Rat                                  |
| Application Route | : Oral                                 |
| NOAEL             | : 1.5 mg/kg body weight                |
| Result            | : negative                             |
| Remarks           | : Based on data from similar materials |

|                   |                                        |
|-------------------|----------------------------------------|
| Species           | : Mouse                                |
| Application Route | : Oral                                 |
| NOAEL             | : 2.0 mg/kg body weight                |
| Result            | : negative                             |
| Remarks           | : Based on data from similar materials |

**Reproductive toxicity**

May damage the unborn child.

**Components:****N-Methyl-2-pyrrolidone:**

|                      |                                                                                                                                                                                                                          |
|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Effects on fertility | : Test Type: Two-generation reproduction toxicity study<br>Species: Rat<br>Application Route: Ingestion<br>Method: OECD Test Guideline 416<br>Result: negative<br>Remarks: The test was conducted according to guideline |
|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                               |                                                                                                                                                                                                         |
|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Effects on foetal development | : Test Type: Embryo-foetal development<br>Species: Rat<br>Application Route: Ingestion<br>Method: OECD Test Guideline 414<br>Result: positive<br>Remarks: The test was conducted according to guideline |
|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Test Type: Fertility/early embryonic development  
Species: Rat  
Application Route: inhalation (vapour)  
Method: OECD Test Guideline 414  
Result: positive  
Remarks: The test was conducted equivalent or similar to guideline

Test Type: Embryo-foetal development  
Species: Rabbit  
Application Route: Ingestion  
Method: OECD Test Guideline 414  
Result: positive  
Remarks: The test was conducted equivalent or similar to guideline

|                                    |                                                                                  |
|------------------------------------|----------------------------------------------------------------------------------|
| Reproductive toxicity - Assessment | : Clear evidence of adverse effects on development, based on animal experiments. |
|------------------------------------|----------------------------------------------------------------------------------|

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Effects on fertility : Test Type: Fertility  
Species: Rat  
Application Route: Oral  
Fertility: NOAEL: 0.6 mg/kg body weight  
Result: Animal testing did not show any effects on fertility.

Effects on foetal development : Test Type: Development  
Species: Mouse  
Application Route: Oral  
Developmental Toxicity: NOAEL: 0.2 mg/kg body weight  
Result: Teratogenic effects, Embryotoxic effects and adverse effects on the offspring were detected only at high maternally toxic doses

Test Type: Development  
Species: Rat  
Application Route: Oral  
Developmental Toxicity: LOAEL: 0.4 mg/kg body weight  
Result: Embryotoxic effects and adverse effects on the offspring were detected.  
Remarks: The mechanism or mode of action may not be relevant in humans.

Test Type: Development  
Species: Rabbit  
Application Route: Oral  
Result: Teratogenic effects, Embryotoxic effects and adverse effects on the offspring were detected only at high maternally toxic doses

**STOT - single exposure**

May cause respiratory irritation.  
May cause damage to organs (Central nervous system) if swallowed.

**Components:****N-Methyl-2-pyrrolidone:**

Assessment : May cause respiratory irritation.

**Ivermectin:**

Target Organs : Central nervous system  
Assessment : Causes damage to organs.

**STOT - repeated exposure**

May cause damage to organs (Central nervous system) through prolonged or repeated exposure if swallowed.

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**Components:****Ivermectin:**

|               |   |                                                                 |
|---------------|---|-----------------------------------------------------------------|
| Target Organs | : | Central nervous system                                          |
| Assessment    | : | Causes damage to organs through prolonged or repeated exposure. |

**Repeated dose toxicity****Components:****N-Methyl-2-pyrrolidone:**

|                   |   |                                               |
|-------------------|---|-----------------------------------------------|
| Species           | : | Rat, male                                     |
| NOAEL             | : | 169 mg/kg                                     |
| LOAEL             | : | 433 mg/kg                                     |
| Application Route | : | Ingestion                                     |
| Exposure time     | : | 90 Days                                       |
| Method            | : | OECD Test Guideline 408                       |
| Remarks           | : | The test was conducted according to guideline |

|                   |   |                                               |
|-------------------|---|-----------------------------------------------|
| Species           | : | Rat                                           |
| NOAEL             | : | 0.5 mg/l                                      |
| LOAEL             | : | 1 mg/l                                        |
| Application Route | : | inhalation (dust/mist/fume)                   |
| Exposure time     | : | 96 Days                                       |
| Method            | : | OECD Test Guideline 413                       |
| Remarks           | : | The test was conducted according to guideline |

|                   |   |                                                           |
|-------------------|---|-----------------------------------------------------------|
| Species           | : | Rabbit, male                                              |
| NOAEL             | : | 826 mg/kg                                                 |
| LOAEL             | : | 1,653 mg/kg                                               |
| Application Route | : | Skin contact                                              |
| Exposure time     | : | 20 Days                                                   |
| Method            | : | OECD Test Guideline 410                                   |
| Remarks           | : | The test was conducted equivalent or similar to guideline |

**Ivermectin:**

|                   |   |                                                                  |
|-------------------|---|------------------------------------------------------------------|
| Species           | : | Dog                                                              |
| NOAEL             | : | 0.5 mg/kg                                                        |
| LOAEL             | : | 1 mg/kg                                                          |
| Application Route | : | Oral                                                             |
| Exposure time     | : | 14 Weeks                                                         |
| Target Organs     | : | Central nervous system                                           |
| Symptoms          | : | Dilatation of the pupil, Tremors, Lack of coordination, anorexia |

|                   |   |                                              |
|-------------------|---|----------------------------------------------|
| Species           | : | Monkey                                       |
| NOAEL             | : | 1.2 mg/kg                                    |
| Application Route | : | Oral                                         |
| Exposure time     | : | 2 Weeks                                      |
| Remarks           | : | No significant adverse effects were reported |

**Ivermectin Liquid Formulation**

|         |                |               |                                 |
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|                   |                               |
|-------------------|-------------------------------|
| Species           | : Rat                         |
| NOAEL             | : 0.4 mg/kg                   |
| LOAEL             | : 0.8 mg/kg                   |
| Application Route | : Oral                        |
| Exposure time     | : 3 Months                    |
| Target Organs     | : spleen, Bone marrow, Kidney |

**Aspiration toxicity**

Not classified based on available information.

**Experience with human exposure****Components:****N-Methyl-2-pyrrolidone:**

Skin contact : Symptoms: Skin irritation

**Ivermectin:**

|              |                                                                                                    |
|--------------|----------------------------------------------------------------------------------------------------|
| Skin contact | : Remarks: Can be absorbed through skin.                                                           |
| Eye contact  | : Remarks: May irritate eyes.                                                                      |
| Ingestion    | : Symptoms: Drowsiness, Dilatation of the pupil, Tremors, Vomiting, anorexia, Lack of coordination |

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**Section 12: Ecological information****Toxicity****Components:****N-Methyl-2-pyrrolidone:**

|                                                                        |                                                                                                                                                                          |
|------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Toxicity to fish                                                       | : LC50 (Oncorhynchus mykiss (rainbow trout)): > 500 mg/l<br>Exposure time: 96 h                                                                                          |
| Toxicity to daphnia and other aquatic invertebrates                    | : EC50 (Daphnia magna (Water flea)): > 1,000 mg/l<br>Exposure time: 24 h<br>Method: DIN 38412<br>Remarks: The test was conducted according to guideline                  |
| Toxicity to algae/aquatic plants                                       | : ErC50 (Desmodesmus subspicatus (green algae)): 600.5 mg/l<br>Exposure time: 72 h<br><br>EC10 (Desmodesmus subspicatus (green algae)): 92.6 mg/l<br>Exposure time: 72 h |
| Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) | : NOEC (Daphnia magna (Water flea)): 12.5 mg/l<br>Exposure time: 21 d<br>Method: OECD Test Guideline 211<br>Remarks: The test was conducted according to guideline       |
| Toxicity to microorganisms                                             | : EC50 (activated sludge): > 600 mg/l<br>Exposure time: 30 min<br>Method: ISO 8192                                                                                       |

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Remarks: The test was conducted according to guideline

**Ivermectin:**

|                                                     |   |                                                                                                                                                                                                                                                            |
|-----------------------------------------------------|---|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Toxicity to fish                                    | : | LC50 (Oncorhynchus mykiss (rainbow trout)): 0.003 mg/l<br>Exposure time: 96 h<br><br>LC50 (Lepomis macrochirus (Bluegill sunfish)): 0.0048 mg/l<br>Exposure time: 96 h                                                                                     |
| Toxicity to daphnia and other aquatic invertebrates | : | EC50 (Daphnia magna (Water flea)): 0.000025 mg/l<br>Exposure time: 48 h                                                                                                                                                                                    |
| Toxicity to algae/aquatic plants                    | : | EC50 (Pseudokirchneriella subcapitata (green algae)): > 9.1 mg/l<br>Exposure time: 72 h<br>Method: OECD Test Guideline 201<br><br>NOEC (Pseudokirchneriella subcapitata (green algae)): 9.1 mg/l<br>Exposure time: 72 h<br>Method: OECD Test Guideline 201 |
| M-Factor (Acute aquatic toxicity)                   | : | 10,000                                                                                                                                                                                                                                                     |
| M-Factor (Chronic aquatic toxicity)                 | : | 10,000                                                                                                                                                                                                                                                     |

**Persistence and degradability****Components:****N-Methyl-2-pyrrolidone:**

|                  |   |                                                                                                                                                                             |
|------------------|---|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Biodegradability | : | Result: Readily biodegradable.<br>Biodegradation: 73 %<br>Exposure time: 28 d<br>Method: OECD Test Guideline 301C<br>Remarks: The test was conducted according to guideline |
|------------------|---|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

**Ivermectin:**

|                  |   |                                                                                    |
|------------------|---|------------------------------------------------------------------------------------|
| Biodegradability | : | Result: Not readily biodegradable.<br>Biodegradation: 50 %<br>Exposure time: 240 d |
|------------------|---|------------------------------------------------------------------------------------|

**Bioaccumulative potential****Components:****N-Methyl-2-pyrrolidone:**

|                                        |   |                                                                                                             |
|----------------------------------------|---|-------------------------------------------------------------------------------------------------------------|
| Partition coefficient: n-octanol/water | : | log Pow: -0.46<br>Method: OECD Test Guideline 107<br>Remarks: The test was conducted according to guideline |
|----------------------------------------|---|-------------------------------------------------------------------------------------------------------------|

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**Ivermectin:**

Bioaccumulation : Bioconcentration factor (BCF): 74

Partition coefficient: n-octanol/water : log Pow: 3.22

**Mobility in soil**

No data available

**Other adverse effects**

No data available

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**Section 13: Disposal considerations****Disposal methods**

Waste from residues : Do not dispose of waste into sewer.  
Dispose of in accordance with local regulations.

Contaminated packaging : Empty containers should be taken to an approved waste handling site for recycling or disposal.  
If not otherwise specified: Dispose of as unused product.

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**Section 14: Transport information****International Regulations****UNRTDG**

UN number : UN 3082

UN proper shipping name : ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.  
(Ivermectin)

Transport hazard class(es) : 9

Packing group : III

Labels : 9

Environmental hazards : yes

**IATA-DGR**

UN/ID No. : UN 3082

UN proper shipping name : Environmentally hazardous substance, liquid, n.o.s.  
(Ivermectin)

Transport hazard class(es) : 9

Packing group : III

Labels : Miscellaneous

Packing instruction (cargo aircraft) : 964

Packing instruction (passenger aircraft) : 964

Environmentally hazardous : yes

**IMDG-Code**

UN number : UN 3082

Proper shipping name : ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID,

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|                            |                        |
|----------------------------|------------------------|
|                            | N.O.S.<br>(Ivermectin) |
| Transport hazard class(es) | : 9                    |
| Packing group              | : III                  |
| Labels                     | : 9                    |
| EmS Code                   | : F-A, S-F             |
| Marine pollutant           | : yes                  |

**Transport in bulk according to IMO instruments**

Not applicable for product as supplied.

**Special precautions for user**

The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

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**Section 15: Regulatory information****Safety, health and environmental regulations specific for the product in question**

Workplace Safety and Health Act and Workplace Safety and Health (General Provisions) Regulations: This product is subjected to the SDS, labelling, PEL and other requirements in the Act/Regulations.

|                                                                                                                               |                  |
|-------------------------------------------------------------------------------------------------------------------------------|------------------|
| Environmental Protection and Management Act and<br>Environmental Protection and Management (Hazardous Substances) Regulations | : Not applicable |
|-------------------------------------------------------------------------------------------------------------------------------|------------------|

|                                                             |                  |
|-------------------------------------------------------------|------------------|
| Fire Safety (Petroleum and Flammable Materials) Regulations | : Not applicable |
|-------------------------------------------------------------|------------------|

**The components of this product are reported in the following inventories:**

|      |                  |
|------|------------------|
| AICS | : not determined |
|------|------------------|

|     |                  |
|-----|------------------|
| DSL | : not determined |
|-----|------------------|

|       |                  |
|-------|------------------|
| IECSC | : not determined |
|-------|------------------|

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**Section 16: Other information**

|               |              |
|---------------|--------------|
| Revision Date | : 03.02.2025 |
|---------------|--------------|

**Further information**

|                                                           |                                                                                                                                                                                     |
|-----------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Sources of key data used to compile the Safety Data Sheet | : Internal technical data, data from raw material SDSs, OECD eChem Portal search results and European Chemicals Agency, <a href="http://echa.europa.eu/">http://echa.europa.eu/</a> |
|-----------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|             |              |
|-------------|--------------|
| Date format | : dd.mm.yyyy |
|-------------|--------------|

**Full text of other abbreviations**

|           |                                             |
|-----------|---------------------------------------------|
| ACGIH BEI | : ACGIH - Biological Exposure Indices (BEI) |
|-----------|---------------------------------------------|

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AIIC - Australian Inventory of Industrial Chemicals; ANTT - National Agency for Transport by Land of Brazil; ASTM - American Society for the Testing of Materials; bw - Body weight; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; Nch - Chilean Norm; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NOM - Official Mexican Norm; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TDG - Transportation of Dangerous Goods; TECI - Thailand Existing Chemicals Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative; WHMIS - Workplace Hazardous Materials Information System

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 is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and shall not be considered a warranty or quality specification of any type. The information provided relates only to the specific material identified at the top of this SDS and may not be valid when the SDS material is used in combination with any other materials or in any process, unless specified in the text. Material users should review the information and recommendations in the specific context of their intended manner of handling, use, processing and storage, including an assessment of the appropriateness of the SDS material in the user's end product, if applicable.

SG / EN