MATERIAL SAFETY DATA SHEET OF
IMIDACLOPRID 95% TC

1. IDENTIFICATION OF THE CHEMICAL PRODUCT AND COMPANY
Supplier: SHANGHAI MINGDOU AGROCHEMICAL CO., LTD
Address: Rm. 1210, Zhenyuan Building, No. 2052 North Zhongshan Rd, Shanghai, China
FAX: +86 21 52912097, 61638378
TEL: +86 21 52912919, 52045380, 52045370
Product name: Imidacloprid 95% TC

2. COMPOSITION/INFORMATION ON INGREDIENTS
Formulation Type: Technical material
Active Ingredients: Imidacloprid
Chemical Abstracts name: 1-[(6-chloro-3-pyridinyl)methyl]-N-nitro-2-imidazolidinimine
IUPAC name: 1-(6-Chloro-3-pyridinyl)methyl-N-nitroimidazolidin-2-ylideneamine
Chemical Family: Neonicotinoid
CAS NO. 138261-41-3; 105827-78-9 former number
Molecular Formula: C₉H₁₀ClN₅O₂
Molecular Weight: 255.7
Structural Formula:

Composition:

<table>
<thead>
<tr>
<th>INGREDIENT</th>
<th>CAS NO</th>
<th>PROPORTION (W/W)</th>
</tr>
</thead>
<tbody>
<tr>
<td>imidacloprid</td>
<td>138261-41-3</td>
<td>≥95%</td>
</tr>
<tr>
<td>other</td>
<td>Not available</td>
<td>≤5%</td>
</tr>
</tbody>
</table>

Other ingredients determined not to be hazardous

3. HAZARDS INDENTIFICATION
Emergency overview: Keep out of reach of children. Caution! Harmful if swallowed. Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
Routes of entry: Ingestion, inhalation, skin absorption.

Health hazards:
Ingestion: Harmful if swallowed.
Skin contact: Repeated skin exposure may cause irritation and allergic disorders.
Eye contact: May be slightly irritating to eyes.

Physical hazards: Not highly flammable.

Environmental hazards: This product is highly toxic to aquatic invertebrates. Keep out of lakes, streams, or ponds. Do not discharge effluent containing this product into lakes, streams, ponds, estuaries, oceans, or other water. Do not discharge effluent containing this product to sewer systems without previously notifying the local sewage treatment plant authority.

4. FIRST AID MEASURES

General Information: You should call The Poisons Information Centre if you feel that you may have been poisoned, burned or irritated by this product. Have this MSDS with you when you call. In case of suspected poisoning: Immediately call a physician.

Inhalation: If inhaled, remove to fresh air and keep warm and at rest. Seek medical advice if at all worried.

Skin contact: Carefully remove contaminated clothing. Wash affected areas with soap and water. Seek medical advice if at all worried.

Eye contact: Rinse eyes immediately with clean water for at least 15 minutes. Obtain medical advice.

Ingestion: Obtain immediate medical advice as above. Do not induce vomiting unless advised to do so by doctor or Poisons Information Centre. Do not give anything by mouth to an unconscious or semi conscious person.

First Aid Facilities: Provide washing facilities in the workplace.

Medical attention Information for the physician:
The active ingredient, imidacloprid belongs to the chemical group, neonicotinoid.
Therapeutic measures: Basic aid, decontamination, symptomatic treatment.

5. FIRE FIGHTING MEASURES

Flash point: Not highly flammable.

Flammable limits:
LFL: Not determined.
UFL: Not determined.

Autoignition temperature: Not determined.
Extinguishing media: Water, foam, extinguishing powder, carbon dioxide, sand.

Hazards combustion products: In a fire, formation of hydrogen chloride, hydrogen cyanide, carbon monoxide and nitrogen oxides can be expected.

Fire-fighting instructions: Keep unnecessary people away. If it can be done safely, remove intact containers from the fire. Otherwise, use water spray to cool them. Bund area with sand or earth to prevent contamination of drains or waterways. Dispose of fire control water or other extinguishing agent and spillage safely later. Do not release contaminated water into the environment.

Protective equipment for firefighters: Firefighters should wear full protective gear, including self-contained breathing apparatus.

6. ACCIDENT RELEASE MEASURES

Personal precautions: Do not touch spilled material. Do not smoke, eat or drink during clean-up operation. Stop leak if possible without personal risk. Reduce vapor with water spray. See Section 8.

Environmental precautions: Prevent spill from spreading or entering waterways or drains.

Method for cleaning up: Take up with absorbent material such as sawdust, peat or binding agent for chemicals. Fill material along with any contaminated soil etc. into sealable containers. Clean affected area with an aqueous detergent and a small amount of water. On completion of clean-up remove and wash all protective clothing and equipment with detergent and water. Any heavily contaminated clothing should be placed in a plastic garbage bag and placed in a sealable drum.

7. HANDLING AND STORAGE

Store and handle in accordance with all current regulations and standards. Keep separated from incompatible substances.

Handling: Do not apply to humans, their clothing, or bedding. Do not contaminate food or use on household tanks.

Storage: Store at normal temperatures, away from children, domestic animals, food and feed products, seed and fertilizer. Do not contaminate other stored products or the storage area by handling or storage of this product. Keep in a well-ventilated room.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure limits: No exposure limits have been established for this material.

Engineering controls: Use local exhaust at all process locations to control employee exposure.

Personal protective equipment (PPE):

Eye protection: Wear splash resistant safety goggles with a face-shield. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.
Skin protection: Wear long sleeves and trousers to prevent skin contact.
Ventilation: Provide local exhaust ventilation system. Ventilation equipment should be explosion-resistant if explosive concentrations of material are present. Ensure compliance with applicable exposure limits.
User safety recommendations: Clean water should be available for washing in case of eye or skin contamination. Educate and train employees in safe use of the product. Follow all label instructions. Launder clothing after use. Wash thoroughly after handling.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: White powder.
Odour: Weak characteristic odour.
Vapor pressure: $4 \times 10^{-7}$ mPa (20°C), $4 \times 10^{-7}$ mPa (25°C).
Melting point: 144°C.
Boiling point: Decomposes before boiling.
Flash point: Not highly flammable.
S.g./density: 1.54 g/cm$^3$ (23°C).
Partition coefficient: $K_{ow} \log P=0.57$ (21°C).
Solubility in water: 0.61 g/l (20°C).
Stability: Stable to hydrolysis at pH 5–11.

10. STABILITY AND REACTIVITY

Chemical stability: Stable under normal temperatures and conditions.
Conditions to avoid: Avoid heat, flames, sparks and other sources of ignition. Containers may rupture or explode if exposed to heat.
Hazardous decomposition product: Proposed: HCl, HCN, CO, NOx.
Incompatible materials: Avoid acid, alkalis, and strong oxidizers.
Hazardous polymerization: Will not polymerize.

11. TOXICOLOGICAL INFORMATION

The following information is for the active ingredient, Imidacloprid.

Acute toxicity:
Oral: LD$_{50}$ for male and female rats 510 mg/kg.
Dermal: LD$_{50} >$5000 mg/kg (rats).
Inhalation: LC$_{50} >$5 mg/l (rat).

Irritant properties:
Skin: not irritant (rabbit).
Eye: not irritant (rabbit).

**Allergenic and sensitizing effects:**
Not considered to be a skin sensitizer (Guinea pig).

**Chronic toxicity:** A 2-year feeding study in rats fed up to 1,800 ppm resulted in a No Observable Effect Level (NOEL) of 100 ppm (5.7 mg/kg body weight in males and 7.6 mg/kg in females). Adverse effects included decreased body weight gain in females at 300 ppm, and increased thyroid lesions in males at 300 ppm and females at 900 ppm. A 1-year feeding study in dogs fed up to 2,500 ppm resulted in a NOEL of 1,250 ppm (41 mg/kg). Adverse effects included increased cholesterol levels in the blood, and some stress to the liver.

**Carcinogenic Effects:** There were no carcinogenic effects in a 2-year carcinogenicity study in rats fed up to 1,800 ppm imidacloprid.

**Genetic effects/Mutagenicity:** Imidacloprid may be weakly mutagenic. In a battery of 23 laboratory mutagenicity assays, imidacloprid tested negative for mutagenic effects in all but two of the assays. It did test positive for causing changes in chromosomes in human lymphocytes, as well as testing positive for genotoxicity in Chinese hamster ovary cells.

**Reproductive effects:** A three generation reproduction study in rats fed up to 700 ppm imidacloprid resulted in a NOEL of 100 ppm (equivalent to 8 mg/kg/day) based on decreased pup body weight observed at the 250 ppm dose level.

**Developmental effects:** A developmental toxicity study in rats given doses up to 100 ppm by gavage on days 6 to 16 of gestation resulted in a NOEL of 30 mg/kg/day (based on skeletal abnormalities observed at the next highest dose tested of 100 ppm). In a developmental toxicity study with rabbits given doses of imidacloprid by gavage during days 6 through 19 of gestation, resulted in a NOEL of 24 mg/kg/day based on decreased body weight and skeletal abnormalities observed at 72 mg/kg/day (highest dose tested).

**Target organ effects:** In short-term feeding studies in rats, there were thyroid lesions associated with very high doses of imidacloprid.

### 12. ECOLOGICAL INFORMATION

The following information is for the active ingredient, Imidacloprid.

**Ecotoxicity:**

- **Birds**  
  Acute oral LD$_{50}$ for Japanese quail 31 mg/kg, for bobwhite quail 152 mg/kg.
  Dietary LC$_{50}$ (5 days): 2225 ppm for Japanese quail.

- **Fish**  
  LC$_{50}$ (96 h): for golden orfe 237 mg/L, rainbow trout 211 mg/L, carp 280 mg/L (96 h).

- **Daphnia**  
  EC$_{50}$ (48 h): for *Daphnia magna* 85 mg/L.
Algae: EC₅₀: for green alga (Pseudokirchneriella subcapitata) > 100 mg/L (72 h)

Bees: LD₅₀ (oral): 0.0037 µg/bee.

Earthworm: LC₅₀ (14 days): 10.7 mg/kg dry soil

**Persistence and degradability:** Imidacloprid is not readily biodegradable. It undergoes slow degradation in the environment and in waste water treatment plants. Degradation is mainly microbiological and aerobic, but photodegradation also occurs. Degradation half-lives in the environment vary much with circumstances, usually from a few months to one year.

**Bioaccumulative potential:** Imidacloprid is not expected to bioaccumulate.

**Mobility in soil:** In the environment, imidacloprid is of moderate mobility.

**13. DISPOSAL CONSIDERATION**

**Waste disposal:** Material that cannot be reused or chemically reprocessed can be disposed of by controlled incineration with flue gas scrubbing or removal to a licensed chemical destruction plant. Do not contaminate water, foodstuffs, feed or seed by storage or disposal.

**Packaging/container disposal:** Triple rinse container (or equivalent) and offer for recycling or reconditioning. The packaging can also be punctured to make it unusable for other purposes and then be disposed of in a sanitary landfill. Disposal of waste and packagings must always be in accordance with all applicable local regulations.

**14. TRANSPORT INFORMATION**

**UN Number:** 3077

**UN Proper shipping name:** Environmentally hazardous substances, solid, n.o.s. (Imidacloprid)

**Transport hazard class:** 9

**Packing group:** III

**Marine pollutant:** Yes

**15. REGULATORY INFORMATION**

**Hazard symbols:**
- N Dangerous for the environment

**Risk phrases:**
- R23 Toxic by inhalation.
- R25 Toxic if swallowed.
- R48 Danger of serious damage to health by prolonged exposure.
- R52/53 Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
Safety phrases:

S2 Keep out of the reach of children.
S7 Keep container tightly closed.
S9 Keep container in a well-ventilated place.
S36 Wear suitable protective clothing.
S39 Wear eye/face protection.
S61 Avoid release to the environment. Refer to special instructions/safety data sheets.

16. OTHER INFORMATION

This MSDS summarizes our best knowledge of the health and safety hazard information of the product and how to safely handle and use the product in the workplace. Each user should read this MSDS and consider the information in the context of the how the product will be handled and used in the workplace including in conjunction with other products.

If clarification or further information is needed to ensure that an appropriate risk assessment can be made the user should contact the company.

END OF MSDS