MATERIAL SAFETY DATA SHEET

1 PRODUCT AND COMPANY IDENTIFICATION

Product Name: CARMEL

Metribuzin 70 WDG

Chemical Family: 4-amino-6-*tert*-butyl-4,5-dihydro-3-methylthio-1,2,4-triazin-5-one.

Uses: Agriculture use as herbicide for use as specified on the product label

Company Identification

Willowood Limited :17 F, Sea view Plaza, No.286 Shau Kei Wan Raod, ,Shau Kei Wan, Hong Kong. Tel +852-25713011

2 COMPOSITION / ACTIVE INGREDIENT INFORMATION

Ingredients	**CAS No.**	**Proportion (% g/kg)**
Metribuzin	21087-64-9	70.0 % (Min)
Other inerts		30.0 % (Min)

Ingredients not precisely identified are proprietary or non-hazardous.

3 HAZARDS IDENTIFICATION

This product is classified as: Xn, Harmful. N, Dangerous to the environment.

Not a Dangerous Good according to the (ADG) Code.

Risk Phrases: R22, R50/53. Harmful if swallowed. Very toxic to aquatic organisms, may cause long-term adverse effects to the aquatic environment.

Safety Phrases: S2, S20, S22, S60, S61, S24/25, S36/37. Keep out of reach of children. When using, do not eat or drink. Do not breathe dust. This material and its container must be disposed of as hazardous waste. Avoid release to the environment. Refer to special instructions/Safety Data Sheets. Avoid contact with skin and eyes. Wear suitable protective clothing and gloves.

SUSMP Classification: S6

ADG Classification: None allocated. Not a Dangerous Good under the ADG Code.

UN Number: None allocated

Acute Effects:

Swallowed: Data suggests that this product is harmful if swallowed.

Eye: This product may irritate eyes. However, it is unlikely to cause any more than mild transient discomfort. It is also unlikely to cause any significant lasting effects.

Skin: This product may irritate skin. However, it is unlikely to cause any more than mild transient discomfort. It is also unlikely to cause any significant lasting effects.

Inhalation: Data suggests that this product should present no significant problems.

Effect on exposure:
Acute: Excessive salivation, sweating, fitahue, weakness, nausea, headache, dizziness, eye and respiratory tract irritation.
Chronic: same as above, plus conjunctivitis, photophobia, and blurred vision

4 FIRST AID MEASURES

First Aid:

Ipeacac Syrup APF should be available in the area where product is used, or in a nearby unlocked medicine cabinet.
If poisoning occurs, contact a Doctor or Poisons Information Centre.
If swallowed, and if more than 15 minutes from a hospital, induce vomiting, preferably using Ipecac Syrup APF.

Eyes: If product gets in eyes, wash material from them with running water. If they begin watering or reddening, take special care in washing thoroughly.

Skin: If product gets on skin, thoroughly wash contacted areas. No further measures should normally be required unless irritation is noticed. If irritation persists, seek medical attention.

Inhalation: No first aid measures normally required. However, if vapours or mists have been inhaled, and irritation has developed, remove to fresh air and observe until recovered. If irritation becomes painful or persists more than about 30 minutes, seek medical advice.

5 FIRE FIGHTING MEASURES

Fire & Explosion Hazard
There is no risk of an explosion from this product under normal cicumstances if it is involved in a fire.

Flashpoint:	Not a flammable.
Flammability limits:	Not applicable. This product is not flammable.
Extinguishing media:	carbon dioxide, dry chemical, foam, water fog.
Special Fire Fighting procedures:	If a significant quantity of this products is involved in a fire, call the fire bridgade. Immediately evacuate the area of unnecessary personnel. When fighting fires involving significant quantities of this product, wear safety boots, non-flammable overalls, gloves, hat, goggles and repirator. All skin areas should be covered.
Unusual Fire & Explosion Hazards:	Fire decomposition products from this product may form toxic and corrosive mixtures in confined spaces. This product is unlikely to spontaneously decompose.

6 ACCIDENTAL RELEASE MEASURES

In the event of a major spill, prevent spillage from entering drains or water course. Evacuate the spill area and deny entry to unnecessary and unprotected personal. Thoroughly launder protective clothing before storage or re-use. Stop leak if safe to do so, and contain spill. Absorb onto sand, vermiculite or other suitable absorbent material. Sweep up and shovel or collect recoverable product into labelled continers for recycling or salvage. After spills, wash area preventing runoff from entering drains. If a significant quantity of material enters drains, advise emergency services. Full details regarding disposal of used containers, spillage and unused material may be found on the label. If there is any conflict between this MSDS and the label, instructions on the label prevail.

7 HANDLING AND STORAGE

No special storage and transport requirements. This product has no UN classification. Observe all relevant regulations regarding sale, transport and storage of this class of product. Containers should be kept closed in order to minimise contamination. Keep from extreme heat and open flames, and make sure that the product does not come into contact with substances listed under “Materials to avoid” below.

8 EXPOSURE CONTROL / PERSONAL PROTECTION

Exposure Standards:
A time weighted average (TWA) has been established for metribuzin, present in significant quantities in this product. This value is 5 mg/m3. The exposure value at TWA is the average airborne concentration of a particular substance when calculated over a normal 8 hour working day for a 5 day working week. The ADI for metribuzin is set at 0.02 mg/kg/day. The corresponding NOEL is set at 2 mg/kg/day.

Engineering controls:
In industrial situations, concentration values below the TWA value should be maintained. Values may be reduced by process modification, use of local exhaust ventilation, capturing substances at the source, or other methods. If you believe air borne concentrations of mists, dusts or vapours are high, you are advised to modify the process or environment to reduce the problem
Personal Protection:
Respiratory Protection: It is usually safe to not use a dust mask or respirator protection on account of this product. However, if the product is being used in dusty or confined conditions, use of a mask or respirator may be preferred.
Protective Gloves: Protective eyewear is not normally necessary when using this product. However, it is always prudent to use protective eyewear.
Clothing: Clean overalls or protective clothing should be worn, preferably with a apron.
Safety boots: Wearing safety boots in industrial situations is adivisory.
Always wash hands before smoking, eating or using the toilet. Wash contaminated clothing and other protective equipment before storing or re-using.

9 PHYSICAL AND CHEMICAL PROPERTIES

Physical Appearance & Properties
Appearance Light brown granule
Odour Slight sulphurous odour.
Solubility in water Miscible.
Boiling Point No information available.
Melting Point 126°C.
Flash Point No information available.

10 STABILITY AND REACTIVITY

Stability & Reactivity

Polymerisation:	This product is unlikely to spontaneously decompose.
Decomposition Products:	Carbon dioxide, and if combustion is incomplete, carbon monoxide and smoke. Nitrogen and its compounds, and under some circumstances, oxiders of nitrogen. Oxides of sulfur and other sulfur compounds. Water.
Materials to avoid:	Strong oxidising agents.

11 TOXICOLOGICAL INFORMATION

Toxicity Acute oral LD50(rat) = 1090-2300 mg/kg
Acute oral LD50(mice) = 700 mg/kg
Acute oral LD50(guinea pig) = 245-274 mg/kg
Acute dermal LD50 (rabbit) = 20,000 mg/kg
Acute inhalation LC50 (rat) = 0.7 mg/L (1 hour)
Acute inhalation LC50 (rat) <0.65 mg/L (4 hour)
Reproductive Effects: No reproductive toxicity.
Teratogenic Effects: No teratogenic effects.
Mutagenic Effects: No evidence of mutagenicity.
Carcinogenic Effects: No carcinogenic effects.
Routes of Exposure Inhalation, ingestion, eye and skin
Health effects from likely routes of exposure
Inhalation: Available data shows that this product is not harmful.
Ingestion: Harmful if swallowed.
Eye: Available data shows that this product is not harmful.
Skin: Available data shows that this product is not harmful.

Effects of Overexposure No information available.
Existing Conditions
Aggravated by Exposure No information available.

Carcinogenicity No (ASCC, IARC, NTP)

Chronic toxicity: No ill effects were observed in dogs fed dietary doses of 12.5 mg/kg/day for 3 months. No effects were apparent in rats receiving 2.5 mg/kg/day over 3 months, but doses of 25 and 75 mg/kg/day caused enlarged livers and thyroid glands. In 2-year feeding studies with rats and dogs, results showed no observable effects at doses of 5 mg/kg/day in rats and 2.5 mg/kg/day in dogs. Reduced weight gain, an increase in the number of deaths, blood chemistry changes, and liver and kidney damage were observed in a 2-year study in which dogs were given 1500 ppm or 37.5 mg/kg/day of Metribuzin.
Reproductive effects: Doses of 15, 45, or 135 mg/kg/day of technical Metribuzin were administered by gavage to rabbits on days 6 through 18 of pregnancy. No effects on the mothers were observed at a dose of 45 mg/kg, but 135 mg/kg lowered maternal weight gain. No effects on the foetuses were observed at any of the doses tested. A threegeneration
study in rats at doses of up to 15 mg/kg/day (the highest dose tested), showed no influence on
reproduction. Metribuzin does not cause reproductive effects.

Teratogenic effects: In rats, reduced foetal body weights were seen at doses of 70 mg/kg/day, and developmental delays were observed at doses of 200 mg/kg/day. Metribuzin did not show teratogenic activity in rabbits at doses of up to 85 mg/kg/day, but did decrease weight gain in offspring. These data suggest that Metribuzin is unlikely to cause
teratogenic effects in humans under normal circumstances.
Mutagenic effects: Tests on live animals and on tissue cultures have shown that Metribuzin has no mutagenic activity.
Carcinogenic effects: There were no indications of carcinogenic effects in rats receiving dietary doses of up to 15 mg/kg/day for 2 years, nor in mice fed up to about 380 mg/kg/day for 2 years. These data suggest that Metribuzin is not carcinogenic.
Organ toxicity: In single high dose studies, Metribuzin appears to depress the central nervous system. Other studies indicate that the target organs of Metribuzin are the thyroid gland and the liver.
Fate in humans and animals: After Metribuzin is absorbed, it is rapidly distributed in the body and excreted unchanged in the urine. In mammals, 90% elimination occurs within 96 hours, about equally distributed between theurine and faeces

12 ECOLOGICAL INFORMATION

- Acute Oral toxicity (LD50) study in birds: LD50>460-680 mg/L(mallard ducks)
- Acute toxicity (LC50) study in fishes: LC50 for 96h 80 ppm,bluegill sunfish 0.39, rainbow trout 76ppm
- Acute Oral or Contact toxicity (LD50) study in honey bees: non-toxic to bees .

Breakdown in soil and groundwater: Metribuzin is of moderate persistence in the soil environment. The half-life of
Metribuzin varies according to soil type and climatic conditions. Soil half-lives of 30 to 120 days have been reported; a
representative value may be approximately 60 days. Metribuzin is poorly bound to most soils and soluble in water, giving it a potential for leaching in many soil types. Soil mobility is affected by many site-specific variables, including
the amount of soil organic matter, particle size distribution, porosity, rainfall, and application rates. Metribuzin has been detected in Ohio rivers and Iowa wells and groundwater. The major mechanism by which Metribuzin is lost from
soil is microbial degradation. Losses due to volatilization or photodegradation are not significant under field conditions.

Breakdown in water: The half-life of Metribuzin in pond water is approximately 7 days. If present, Metribuzin would
most likely be found in the water column rather than the sediment, due to its low binding affinity and high water solubility.

Breakdown in vegetation: Metribuzin is absorbed through the leaves when plants are given surface treatment, but the primary route for uptake is through the root system. From the roots, it is translocated upward, becoming concentrated in the roots, stems, and leaves of treated plants. In non-susceptible plants it is deaminized to more water-soluble conjugates; in susceptible plants it is not metabolized and disrupts photosynthesis in the chloroplast.

13 DISPOSAL

Disposal should be carried out in accordance with local, state and national legislation.

14 TRANSPORT INFORMATION

This product has no UN classification. Observe all relevant regulations regarding , transport and this class of product

15 REGULATORY INFORMATION

Effect on exposure:
Acute: Excessive salivation, sweating, fitahue, weakness, nausea, headache, dizziness, eye and respiratory tract irritation.

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This product is classified as: Xn, Harmful. N, Dangerous to the environment. Labelling to be done with these symbols
Not a Dangerous Good according to the Australian Dangerous Goods (ADG) Code.
Risk Phrases:
R22, R50/53. Harmful if swallowed. Very toxic to aquatic organisms, may cause long-term adverse effects to the aquatic environment.

Safety Phrases: S2, S20, S22, S60, S61, S24/25, S36/37.

16 OTHER INFORMATION

The information provided in this Material Safety Data Sheet is correct to the best of our knowledge. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification, since the conditions of the operations mentioned are beyond our control. 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. Willowood disclaims any liability for loss or damage resulting from the use of these data, information or suggestions.

----------END OF MSDS----------

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