

Nichino America, Inc. Pyresta® Herbicide

1. IDENTIFICATION

Product Name: Pyresta Herbicide
General Use: Herbicide
Product Description: Emulsifiable Concentrate
EPA Reg. No.: 71711-35

Manufacturer
Main Headquarters: Nihon Nohyaku Co., Ltd., Kyobashi OM Building, 19-8
Kyobashi 1-chome, Chuo-ku, Tokyo 104-8386 JAPAN

US Connection: Nichino America Inc.
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Emergency and health and safety inquiries: (800) 348-5832 (24 hours)
In case of fire or spills: (800) 424-9300 (24 hours)
In case of international shipments: (703) 527-3887 (24 hours)

2. HAZARD(S) IDENTIFICATION

Emergency Overview: Caution: Causes moderate eye damage. Do not get in eye, on skin, or on clothing. Harmful if swallowed. Harmful if absorbed through skin. Wash thoroughly with soap and water after handling. Avoid contact with skin and breathing spray mist.

Physical Hazards: Combustible liquid

Potential Health Effects: Primary route(s) of entry: Eye contact, Skin contact, Ingestion

Eye contact: Causes moderate eye damage.
Dermal: Harmful if absorbed through skin. Does not cause skin sensitization in animal studies.
Ingestion: Harmful if swallowed.
Inhalation: Avoid breathing spray mist.
Chronic (cancer information): The active ingredient pyraflufen-ethyl is not classified as a carcinogen by NTP, OSHA, IARC (International

Agency for Research on Cancer.

The active ingredient 2,4-D is not classified as a carcinogen by ACGIH, NTP or OSHA. IARC classifies chlorophenoxy herbicides such as 2,4-D class 2B carcinogens, the category for limited evidence for carcinogenicity in humans.

Refer to Section 11 for detailed toxicological information.

3. COMPOSITION/INFORMATION ON INGREDIENTS

| | | |
|------------------------------|---|--------------|
| Chemical Ingredients: | Active ingredient: Pyraflufen-ethyl | 0.2% |
| | Active ingredient: 2,4-D 2-Ethylhexyl ester | 60.0% |
| | Other Ingredients*: | <u>39.8%</u> |
| | Total: | 100.0% |

*contains petroleum distillates

Specific chemical identity of other ingredient(s) and percentage of composition withheld as trade secret.

Chemical Name of

Active Ingredient (CAS): Acetic acid, 2-[2-chloro-5-[4-chloro-5-(difluoromethoxy)-1-methyl-1*H*-pyrazol-3-yl]-4-fluorophenoxy]-, ethyl ester

CAS Registry No.: 129630-19-9

... and

Chemical Name of

Active Ingredient (CAS): Acetic acid, 2-(2,4-dichlorophenoxy)-, 2-ethylhexyl ester

CAS Registry No.: 1928-43-4

4. FIRST AID MEASURES

Eye Contact

Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first five minutes, then continue rinsing eye.

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| | Call a poison control center or doctor for treatment advice |
| Skin Contact | Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice. |
| Ingestion | Call poison control center or doctor immediately for treatment advice. Do not give any liquid to the person. Do not induce vomiting unless told to do so by the poison control center or doctor. Do not give anything by mouth to an unconscious person. |
| Inhalation | Move person to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth, if possible. Call a poison control center or doctor for further treatment advice. |

Note to Physician: Contains petroleum distillate. Vomiting may cause aspiration pneumonia.

5. FIRE FIGHTING MEASURES

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| Flash Point: | 71.8°C (161°F) |
| Fire and Explosion Hazards: | No known explosion characteristics. |
| Extinguishing Media: | Water, foam, carbon dioxide, or dry powder |
| Special Fire-Fighting Procedure: | Wear positive pressure self-contained breathing apparatus. Spray containers with water to keep cool. Avoid runoff from extinguishing media such as water, foam, and dry chemicals into ponds, rivers, and lakes due to danger of acute toxicity to aquatic organisms. |
| Hazardous Combustion Products: | Combustion or thermal decomposition will evolve toxic vapors (CO, NOx, HCl, etc.). |

6. ACCIDENTAL RELEASE MEASURES

General and Disposal: Use proper protective equipment to minimize personal exposure (see Section 8). Take all necessary action to prevent and to remedy the effects of the spill. Ensure that the disposal is in compliance with federal or local disposal regulations (see Section 13). Notify the appropriate authorities immediately (see Section 15 for any applicable Reportable Quantity (RQ)). Report to authorities if water enters watercourse or sewer.

Land Spill or Leak:

Liquid spills on the floor or other impervious surfaces should be contained or diked and then absorbed with sawdust, sand, bentonite, or other absorbent clay. Collect contaminated absorbent, and place it in a properly labeled metal drum with lid. Thoroughly scrub the floor or other impervious surface with a strong industrial type detergent and rinse with water.

Liquid spills that soak into the ground should be dug up and placed in metal drums. When a large spill or leakage is found, wear protective clothing and respirator to avoid exposure.

Avoid contaminated absorbents or water flow into ponds, rivers, and lakes, due to the danger of acute toxicity to aquatic organisms.

7. HANDLING AND STORAGE

Handling Precautions:

- Wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.
- Remove and wash contaminated clothing before reuse.

Storage Precautions:

- Do not contaminate water, food, or feed.
- Store in a cool place.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls

(Local exhaust): Ventilation may be necessary under certain confined conditions. If practical, use ventilation at the sources of air contamination. Control airborne contaminants below the exposure guidelines (see below for any applicable OSHA / ACGIH exposure limits).

Personal Protective Equipment (PPE):

Eye/Face Protection: Wear protective eyewear when there is significant potential for eye contact. .

Skin Protection: Wear long-sleeved shirt, long pants, socks, shoes, and chemical-resistant gloves (such as nitrile or butyl) to prevent skin contact. Wash contaminated skin promptly with soap and water. Launder contaminated clothing and protective equipment.

Respiratory Protection: Ensure good ventilation. Avoid breathing mist or vapor. If ventilation is inadequate, use approved respiratory protection equipment when airborne exposure limits are exceeded.

Exposure Limits:

| <u>Ingredient:</u> | <u>ACGIH</u> | <u>OSHA PEL</u> |
|---------------------------|-----------------------------|--------------------------|
| Pyraflufen-ethyl | Not established | Not established |
| 2,4-D-2EHE* | 10 mg/m ³ TWA | 10 mg/m ³ TWA |
| Naphthalene | 10 ppm TWA (15 ppm STEL) | 50 mg/m ³ TWA |

*Based on adopted limit for 2,4-D (CAS No. 94-75-7)

9. PHYSICAL AND CHEMICAL PROPERTIES

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| Appearance: | Clear liquid |
| Odor: | Hydrocarbon odor |
| Physical state: | Liquid |
| pH: | 4.11 |
| Vapor pressure | Pyraflufen-ethyl 1.6x10 ⁻⁸ Pa (25°C) 2,4-D-2EHE Not determined |
| Density | 1.059 g/mL |
| Viscosity (Kinematic) | 15.68 centistokes (20°C), 7.129 centistokes (40°C) |

10. STABILITY AND REACTIVITY

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| Stability | Stable under normal conditions |
| Conditions to avoid | Excessive heat. Do not store near heat or flame. |
| Auto ignition | Not determined. |
| Hazardous polymerization | None |

11. TOXICOLOGICAL INFORMATION

The following data were developed using the formulated product Pyresta

Herbicide:

Acute Studies:

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|--|---------------------------------|
| Oral LD₅₀ (rat): | 2,500 mg/kg bw (female) |
| Dermal LD₅₀ (rat): | >2000 mg/kg bw (male/female) |
| Inhalation LC₅₀ (rat): | >2.09 mg/L (4 hrs; male/female) |
| Eye irritation (rabbit): | Mild irritant |
| Skin irritation (rabbit): | Mild irritant |
| Skin sensitization (guinea pig): | Not a sensitizer |

The following data were developed using pyraflufen-ethyl technical and 2,4-D except where noted:

Subchronic and Chronic Effects:

- **Pyraflufen-ethyl**
A 90-day rat feeding study was conducted at dose levels up to 15,000 ppm pyraflufen-ethyl. Liver and kidney effects were observed at the highest dose. The no observed effect level (NOEL) in this study was considered to be 1,000 ppm (~90 mg/kg body weight/day). In a 90-day oral toxicity study in dogs, pyraflufen-ethyl was administered at dose levels up to 1,000 mg/kg body weight/day. No effects in body weight or organ weight, clinical chemistry, hematology, histopathology, or gross pathology were observed. In long term studies, no effects were observed in dogs exposed for one year to a maximum dose of 1,000 mg/kg body weight/day. In a two year rat chronic study, liver and kidney effects were observed at 2,000 ppm. The NOEL was 400 ppm (~20mg/kg body weight/day).
- **2,4-D**
Major treatment related findings in three subchronic toxicity studies in rats were conducted on three forms of 2,4-D (the parent form, 2,4-D acid; 2,4-D dimethylamine salt (DMA); and 2,4-D 2-ethylhexyl ester (2-EHE)) included decreases in red cell mass, decreases in T3 and T4 levels, decreases in ovary and testes weights, increases in liver, kidney, and thyroid weights, and cataracts and retinal degeneration (high-dose females). These data demonstrated the comparable toxicities of the three forms and support a subchronic no-observed-effect level of 15 mg/kg/day. [Charles JM, et al; Fundam Appl Toxicol 33 (2): 161-165 (1996)] PubMed Abstract.

Cancer Effects:

- **Pyraflufen-ethyl**
Pyraflufen ethyl was tested in lifetime studies in rats and mice. There was no evidence of carcinogenicity in the rat at doses as high as 10,000 ppm (~470 mg/kg body weight/day). In the mouse study, the incidence of hepatocellular adenomas was increased in mice receiving 5,000 ppm (~ 524 - 547 mg/kg body weight/day), a dose level considered to be in excess of a MTD (maximum tolerated dose). Based on the combined incidence of male mouse hepatocellular adenomas, carcinomas, and/or hepatoblastomas, the EPA has classified pyraflufen-ethyl as “Likely to be Carcinogenic to Humans”. The EPA classification of pyraflufen-ethyl represents potential hazard without consideration of exposure information. The active ingredient pyraflufen-ethyl is not classified as a carcinogen by NTP, OSHA, or IARC.
- **2,4-D**
2,4-D is classified as a Group D chemical (not classifiable as to human carcinogenicity).
- **Naphthalene**
IARC classifies naphthalene as a Group 2B carcinogen, the category for limited evidence for carcinogenicity in humans. National Toxicity Program (NTP Report on Carcinogens, Twelfth Edition 2011) reasonably anticipates naphthalene to be a human carcinogen based on sufficient evidence from studies in experimental animals.

Teratogenicity (Birth Defects):

- **Pyraflufen-ethyl**
Pyraflufen-ethyl is not a developmental toxicant.
- **2,4-D**
No evidence that 2,4-D is a selective development toxicant.

Reproductive Effects:

- **Pyraflufen-ethyl**
Pyraflufen-ethyl is not a reproductive toxicant.
- **2,4-D**
No impairment of reproductive function attributable to 2,4-D has been noted in laboratory animal studies.

Neurotoxicity:

- **Pyraflufen-ethyl**
There was no evidence of neurotoxicity after oral exposure in acute or subchronic studies conducted with pyraflufen-ethyl.

- 2,4-D
Repeated overexposure to phenoxy herbicides may cause effects to gross motor function. Rare cases of peripheral nerve damage have been reported, but extensive animal studies have failed to substantiate these observations, even at high doses for prolonged periods.

Immunotoxicity:

- Pyraflufen-ethyl
Suppression of the humoral immune response was measured in male rats exposed to 12,000 ppm of pyraflufen-ethyl (equivalent to ~943 mg/kg body weight/day) in a 28-day feeding study, the same dose at which systemic toxicity was evident. No humoral immune suppression was observed in female rats at any dose level.
- 2,4-D
Immunotoxic responses were not observed in dogs dosed with 1.0 to 7.5 mg/kg/day for up to one year.

Mutagenicity (Genetic Effects):

- Pyraflufen-ethyl
Pyraflufen-ethyl was not mutagenic in any of the genotoxicity studies conducted.
- 2,4-D
Based on the overall pattern of responses observed in both *in vitro* and *in vivo* genotoxicity test, 2,4-D was not mutagenic, although some cytogenic effects were observed. 2,4-D acid is currently considered to be representative of all nine member chemicals of the 2,4-D case.

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| 12. ECOLOGICAL INFORMATION |
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Environmental Precautions:

This product is toxic to fish and aquatic invertebrates. This product may contaminate water through drift of spray in wind or via runoff events. Use care when applying in areas adjacent to any body of water. Do not apply directly to water, to areas where surface water is present, or to intertidal areas below the mean high water mark. Drift and runoff may be hazardous to aquatic organisms in water adjacent to treated areas. Do not contaminate water when disposing of equipment wash waters or rinsate. Do not apply when weather conditions favor drift from treated areas. Do not apply if rainfall is expected within one hour.

13. DISPOSAL CONSIDERATION

General Disposal:

Do not contaminate water, food, or feed by disposal. Open dumping is prohibited. Pesticide wastes are toxic. Improper disposal of excess pesticide, pesticide spray, or rinsate is a violation of Federal law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.

Container Disposal:

Non-refillable container. Do not reuse or refill this container. Triple rinse (or equivalent) promptly after emptying. Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container $\frac{1}{2}$ full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times. Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or by incineration, or, if allowed by State or local authorities, by burning. If burned, stay out of smoke. If drum is contaminated and cannot be reused, dispose of in the manner required for its liner.

14. TRANSPORT INFORMATION

Liquid transport:

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| DOT: | Non-bulk (≤ 119 gallons): Combustible liquid, n.o.s. (petroleum distillate mixture), Comb. Liq., NA 1993, III. Bulk (>119 gallons): Combustible liquid, n.o.s. (petroleum distillate mixture), Comb. Liq., NA 1993, III |
|-------------|---|

Pyresta **is not regulated for transport** unless shipped by water, air, or in bulk containers.

15. REGULATORY INFORMATION

U.S. Federal Regulatory Information:

EPA Registration Number: 71711-35

TSCA Inventory: Registered pesticide; exempt from TSCA

SARA Title III Notification and Information:

Section 302 (EHS) Ingredients: None

Section 304 (EHS)

or CERCLA Ingredients (RQ):

| Name | CAS # | Final Reportable Quantity |
|-------------------------------------|------------|---------------------------|
| Acetic acid, (2,4-Dichlorophenoxy)- | 94-75-7 | 100 lbs |
| Calcium dodecylbenzenesulfonate | 26264-06-2 | 1000 lbs |
| Naphthalene | 91-20-3 | 100 lbs |

Section 313 Ingredients:

2,4-D-2-ethylhexyl ester (CAS No. 1928-43-4)
Pyrrolidone (CAS No. 872-50-4)
Naphthalene (CAS No. 91-20-3)
1,2,4-Trimethylbenzene (CAS No. 95-63-6)
N-Methyl-2-pyrrolidone (CAS No. 872-50-4)

U.S. State Regulatory Information:

U.S. State Right-to-Know (RTK) Ingredients:

- Naphthalene (CAS No. 91-20-3)
- 1,2,4-Trimethylbenzene (CAS No. 95-63-6) –
- Solvent Naphtha (Petroleum), Heavy Aromatic (CAS No. 64742-94-5)
- Soybean oil, epoxidized (CAS No. 8013-07-8) –

California Proposition 65 List:

- California Proposition 65: WARNING. This product contains chemicals known to the State of California to cause cancer or birth defects or other reproductive harm.
 - Naphthalene (CAS No. 91-20-3) – CA CARC
 - N-Methyl-2-pyrrolidone (CAS No. 872-50-4) - CA DEVELOPMENTAL

16. OTHER INFORMATION

HMIS® Hazard Rating:

Health: 2*
Flammability: 2
Physical Hazard: 0

*indicates both acute and chronic health hazard

NFPA Hazard Rating:

Health: 2
Flammability: 2
Reactivity: 0
Special Hazards: None

Prepared by: Regulatory Affairs

Date: 8/12/2014

Reason for Editing: Reviewed and updated information and formatting for each section.

Disclaimer of Expressed and Implied Warranties:

This information is provided in good faith but without express or implied warranty. Buyer assumes all responsibility for safety and use not in accordance with FIFRA label instructions.