

# Material Safety Data Sheet

## CHARIOT™ INSECTICIDE

SDS #: 6675-1-A  
Revision Date: 2012-02-17  
Version 1



This MSDS has been prepared to meet U.S. OSHA Hazard Communication Standard 29 CFR 1910.1200 and Canada's Workplace Hazardous Materials Information System (WHMIS) requirements.

### 1. PRODUCT AND COMPANY IDENTIFICATION

<b>Product name</b>	CHARIOT™ INSECTICIDE
<b>Active Ingredient(s)</b>	Zeta-cypermethrin, Chlorpyrifos
<b>Alternate Commercial Name</b>	F9047-2 Insecticide
<b>Synonyms</b>	FMC 233570; (+/-)- $\alpha$ -cyano(3-phenoxyphenyl)methyl (+/-) cis, trans-3-(2,2-dichloroethenyl)-2,2-dimethylcyclopropanecarboxylate; IUPAC: (RS)- $\alpha$ -cyano-3-phenoxybenzyl (1RS)-cis-trans-3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropanecarboxylate;; O,O-Diethyl O-3,5,6-trichloropyridin-2-yl phosphorothioate
<b>Chemical Family</b>	Pyrethroid Pesticide, Organophosphate Pesticide
<b>Recommended use</b>	Insecticide
<b>Manufacturer</b> FMC Corporation Agricultural Products Group 1735 Market Street Philadelphia, PA 19103 General Information: Phone: (215) 299-6000 E-Mail: msdsinfo@fmc.com	<b>Emergency telephone number</b>  Medical Emergencies: (800) 331-3148 (U.S.A. & Canada) +1 (651) 632-6793 (All Other Countries - Collect) For leak, fire, spill or accident emergencies, call: +1 800 / 424 9300 (CHEMTREC - U.S.A.) +1 703 / 527 3887 (CHEMTREC - Collect - All Other Countries)

### 2. Hazards identification

<b>Appearance</b>	amber liquid
<b>Physical state</b>	liquid
<b>Odor</b>	Petroleum solvent
<b>Physical or Chemical Hazards</b>	.
<b>Flammable properties</b>	Combustible liquid
<b>Potential health effects</b> <b>Principle Routes of Exposure</b> <b>Acute effects</b>	Eye contact, Skin contact, Inhalation, Ingestion.
<b>Eyes</b>	Severely irritating (eyes).
<b>Skin</b>	Irritating to skin. May cause sensitization by skin contact.
<b>Inhalation</b>	Toxic by inhalation. May cause drowsiness and dizziness.

**Ingestion** Toxic if swallowed. May cause central nervous system depression. Potential for aspiration if swallowed.

**Chronic effects** Repeated or prolonged exposure may cause central nervous system effects. Effects are expected to be similar to those that are seen with acute toxicity. Chronic exposure to aromatic hydrocarbons may cause headaches, dizziness, loss of sensations or feelings (such as numbness), and liver and kidney damage.

**Environmental hazard** Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

**3. Composition/information on ingredients**

**Hazardous ingredients**

Chemical Name	CAS-No	Weight %
Naphtha (petroleum), heavy aromatic	64742-94-5	40-50
Chlorpyrifos	2921-88-2	31.75
Naphthalene	91-20-3	<4.5
Zeta-cypermethrin (F2700)	52315-07-8	3.08
Isobutyl alcohol	78-83-1	1-5

**4. First aid measures**

**Eye contact** Hold eyes open and rinse slowly and gently with water for 15 to 20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control center or doctor for further 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.

**Inhalation** Move to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably by mouth-to-mouth, if possible. Call a poison control center or doctor for further treatment advice.

**Ingestion** Immediately call a poison control center or doctor. Do not induce vomiting unless told to do so by a poison control center or doctor. Do not give any liquid to the person. Do not give anything by mouth to an unconscious person.

**Notes to physician** Contains petroleum distillate. Vomiting may cause aspiration pneumonia. This product is a pyrethroid. If large amounts have been ingested, the stomach and intestines should be evacuated. Treatment is symptomatic and supportive. Digestible fats, oils, or alcohol may increase absorption and so should be avoided. This product contains a reversible cholinesterase inhibitor. Atropine sulfate is antidotal. Support respiration as needed with removal of secretions, maintenance of a patent airway and, if necessary, artificial ventilation. If cyanosis is absent: Adults - start treatment by giving 2 mg atropine intravenously or intramuscularly, if necessary, and repeat with 0.4 - 2.0 mg atropine at 15 minute intervals until atropinization occurs (tachycardia, flushed skin, dry mouth, mydriasis); Children under 12 - initial dose = 0.05 mg/kg body weight and repeat dose = 0.02 - 0.05 mg/kg body weight. Start 2-PAM at the same time, following manufacturer's recommended dosages and administration. Morphine, reserpine, phenothiazines and theophylline are probably contraindicated. At first sign of pulmonary edema, the patient should be given supplemental oxygen and treated symptomatically. Observe patient to insure that these symptoms do not recur as atropinization wears off. If in eyes, instill one drop of homatropine. Treatment is otherwise controlled removal of exposure followed by symptomatic and supportive care.

**5. Fire-fighting measures**

**Flammable properties** Combustible liquid

**Flash Point** 58 °C / 136 °F

**Sensitivity to Mechanical Impact** not applicable

**Sensitivity to Static Discharge** not applicable

**Suitable extinguishing media** Foam, Carbon dioxide (CO<sub>2</sub>), Dry chemical, Soft stream or water fog only if necessary.

**Protective equipment and precautions for firefighters** Wear self-contained breathing apparatus and protective suit.

**NFPA**

<b>Health Hazard</b>	2
<b>Flammability</b>	1
<b>Stability</b>	0
<b>Special Hazards</b>	-

**6. Accidental release measures**

**Personal precautions** Isolate and post spill area. Remove all sources of ignition. Wear suitable protective clothing, gloves and eye/face protection. For personal protection see section 8.

**Environmental precautions** Keep people and animals away from and upwind of spill/leak. Keep material out of lakes, streams, ponds, and sewer drains.

**Methods for containment** Dike to prevent runoff. Absorb with earth, sand or other non-combustible material and transfer to containers for later disposal.

**Methods for cleaning up** Clean and neutralize spill area, tools and equipment by washing with bleach water and soap. Absorb rinsate and add to the collected waste. Waste must be classified and labeled prior to recycling or disposal. Dispose of waste as indicated in Section 13.

**Other** For further clean-up instructions call FMC Emergency Hotline number listed in Section 1 "Product and Company Identification" above.

**7. Handling and storage**

**Handling** Do not contaminate other pesticides, fertilizers, water, food or feed by storage or disposal.

**Storage** Keep in a dry, cool and well-ventilated place. Keep away from open flames, hot surfaces and sources of ignition. Keep out of reach of children and animals. Store in original container only.

**8. Exposure controls/personal protection**

**Exposure guidelines**

Chemical Name	ACGIH TLV	OSHA PEL	NIOSH	Mexico
Chlorpyrifos 2921-88-2	S* TWA: 0.1 mg/m <sup>3</sup>		TWA: 0.2 mg/m <sup>3</sup> STEL: 0.6 mg/m <sup>3</sup>	Mexico: S* Mexico: TWA 0.2 mg/m <sup>3</sup> Mexico: STEL 0.6 mg/m <sup>3</sup>
Naphthalene 91-20-3	S* STEL 15 ppm TWA: 10 ppm	TWA: 10 ppm TWA: 50 mg/m <sup>3</sup>	IDLH: 250 ppm TWA: 10 ppm TWA: 50 mg/m <sup>3</sup> STEL: 15 ppm STEL: 75 mg/m <sup>3</sup>	Mexico: TWA 10 ppm Mexico: TWA 50 mg/m <sup>3</sup> Mexico: STEL 15 ppm Mexico: STEL 75 mg/m <sup>3</sup>
Isobutyl alcohol 78-83-1	TWA: 50 ppm	TWA: 100 ppm TWA: 300 mg/m <sup>3</sup>	IDLH: 1600 ppm TWA: 50 ppm TWA: 150 mg/m <sup>3</sup>	Mexico: TWA 50 ppm Mexico: TWA 150 mg/m <sup>3</sup> Mexico: STEL 75 ppm Mexico: STEL 225 mg/m <sup>3</sup>

Chemical Name	British Columbia	Quebec	Ontario TWA/EV	Alberta
Chlorpyrifos 2921-88-2	TWA: 0.1 mg/m <sup>3</sup> Skin	TWA: 0.2 mg/m <sup>3</sup> Skin	TWA: 0.1 mg/m <sup>3</sup> Skin	TWA: 0.1 mg/m <sup>3</sup> Skin

Naphthalene 91-20-3	TWA: 10 ppm STEL: 15 ppm Skin	TWA: 10 ppm TWA: 52 mg/m <sup>3</sup> STEL: 15 ppm STEL: 79 mg/m <sup>3</sup>	TWA: 10 ppm STEL: 15 ppm Skin	TWA: 10 ppm TWA: 52 mg/m <sup>3</sup> STEL: 15 ppm STEL: 79 mg/m <sup>3</sup> Skin
Isobutyl alcohol 78-83-1	TWA: 50 ppm	TWA: 50 ppm TWA: 152 mg/m <sup>3</sup>	TWA: 50 ppm	TWA: 50 ppm TWA: 152 mg/m <sup>3</sup>

**Occupational exposure controls**

**Engineering measures**

Apply technical measures to comply with the occupational exposure limits. When working in confined spaces (tanks, containers, etc.), ensure that there is a supply of air suitable for breathing and wear the recommended equipment.

**Personal Protective Equipment**

**General Information**

If the product is used in mixtures, it is recommended that you contact the appropriate protective equipment suppliers. These recommendations apply to the product as supplied.

**Respiratory protection**

For dust, splash, mist or spray exposures wear a filtering facepiece respirator (N95, R95, or P95) which is approved for pesticides (U.S. NIOSH/MSHA, EU CEN or comparable certification organization).

**Eye/face protection**

For dust, splash, mist or spray exposure, wear chemical protective goggles or a face-shield.

**Skin and body protection**

Coveralls worn over long-sleeved shirt and long pants Socks. Wear chemical-resistant footwear, gloves and headgear.

**Hand protection**

Rubber/latex/neoprene or other suitable chemical resistant gloves.

**Hygiene measures**

Clean water should be available for washing in case of eye or skin contamination. Wash skin prior to eating, drinking, chewing gum or using tobacco. Shower or bathe at the end of working. Remove and wash contaminated clothing before re-use. Launder work clothing separately from regular household laundry.

**9. Physical and chemical properties**

<b>Appearance</b>	amber liquid
<b>Color</b>	amber
<b>Physical state</b>	liquid
<b>Odor</b>	Petroleum solvent
<b>pH</b>	4.3
<b>Melting Point/Range</b>	No information available.
<b>Freezing point</b>	No information available
<b>Boiling Point/Range</b>	not applicable
<b>Flash Point</b>	58 °C / 136 °F
<b>Evaporation rate</b>	not applicable
<b>Autoignition Temperature</b>	not applicable
<b>Flammable properties</b>	Combustible liquid
<b>Vapor pressure</b>	No information available
<b>Vapor density</b>	No information available
<b>Density</b>	8.94 lb/gal
<b>Water solubility</b>	No information available
<b>Percent volatile</b>	No information available
<b>Partition coefficient:</b>	not applicable
<b>Viscosity</b>	22.4 mPasec @ 23.5 °C; 17 mPasec @ 44.5 °C
<b>Oxidizing properties</b>	not applicable

**10. Stability and reactivity**

<b>Stability</b>	Stable
<b>Conditions to avoid</b>	Heat, flames and sparks
<b>Hazardous decomposition products</b>	Carbon oxides, Hydrogen cyanide, Hydrogen chloride, Sulfur oxides, Phosphorous oxides, Chlorine.
<b>Hazardous polymerization</b>	Hazardous polymerization does not occur

**11. Toxicological information**

**Acute Toxicity**

Chlorpyrifos is a reversible cholinesterase-inhibiting pesticide, which elicits symptoms in humans typical of cholinesterase inhibition including headache, light-headedness, weakness, abdominal cramps, nausea, excessive salivation, perspiration and blurred vision. More severe signs of cholinesterase inhibition include tearing, pin-point pupils, excessive respiratory secretions, cyanosis, convulsions, generalized tremor and coma.

<b>Eye contact</b>	Severely irritating (eyes) (rabbit).
<b>Skin contact</b>	Severely irritating (rabbit).
<b>Ingestion</b>	Toxic if swallowed. Potential for aspiration if swallowed. Vomiting after ingestion of this product may cause aspiration of aromatic hydrocarbons into the lungs, which may result in fatal pulmonary edema. Large doses of zeta-cypermethrin, ingested by laboratory animals, may produce signs of toxicity including tremors, incoordination, convulsions, staggered gait, and oral discharge.
<b>Inhalation</b>	Toxic by inhalation. Inhalation of aromatic hydrocarbon vapors may cause dizziness, disturbances in vision, drowsiness, respiratory irritation, and eye, skin and mucous membrane irritation.
<b>LD50 Dermal</b>	> 5000 mg/kg (rabbit)
<b>LD50 Oral</b>	55 - 175 mg/kg (rat)
<b>LC50 Inhalation:</b>	0.52 - 2.05 mg/L 4 hr (rat)
<b>Sensitization</b>	May cause sensitization by skin contact.

**Chronic Toxicity - Other Ingredient(s)**

<b>Chronic Toxicity</b>	Repeated or prolonged exposure may cause central nervous system effects. Effects are expected to be similar to those that are seen with acute toxicity. Chronic exposure to aromatic hydrocarbons may cause headaches, dizziness, loss of sensations or feelings (such as numbness), and liver and kidney damage.
<b>Carcinogenicity</b>	Not recognized as carcinogenic by Research Agencies (IARC, NTP, OSHA, ACGIH). Cypermethrin caused an increase in benign lung tumors in mice, but not in rats, and was negative for genotoxicity. EPA has classified zeta-cypermethrin as a possible human carcinogen based on this information, but does not regulate based on its low cancer risk. Chlorpyrifos: Did not show carcinogenic effects in animal experiments.
<b>Mutagenicity</b>	Zeta-cypermethrin, Chlorpyrifos: Not genotoxic.
<b>Reproductive toxicity</b>	Zeta-cypermethrin, Chlorpyrifos: No toxicity to reproduction.
<b>Neurological Effects</b>	Cypermethrin did not cause neurotoxicity in animal experiments. Chlorpyrifos: Chronic exposure to animals has caused decreased cholinesterase activity (erythrocyte, plasma, and/or brain).
<b>Developmental Toxicity</b>	Zeta-cypermethrin, Chlorpyrifos: Not teratogenic in animal studies.

Chemical Name	ACGIH	IARC	NTP	OSHA	NIOSH - Target Organs
Naphthalene		2B	Reasonably Anticipated	X	eyes,blood,liver,kidneys,skin,CNS

Isobutyl alcohol					eyes,CNS,respiratory system,skin
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**12. Ecological information**

Marine pollutant Chlorpyrifos, Zeta-cypermethrin  
 Ecotoxicity

**Chlorpyrifos (2921-88-2)**

Active Ingredient(s)	Duration	Species	Value	Units
Chlorpyrifos	LC50	Daphnia	<0.1	mg/L
	LD50	Bird	51-500	mg/kg

**Zeta-cypermethrin (F2700) (52315-07-8)**

Active Ingredient(s)	Duration	Species	Value	Units
Zeta-cypermethrin	LC50	Aquatic organisms	0.005 - 0.15	µg/L
	LC50	Fish	0.07 - 2.37	µg/L
	LD50 Oral	Bobwhite quail	>2000	mg/kg
	LD50	Bee	0.0014 - 0.043	µg/bee

Chemical Name	Toxicity to algae	Toxicity to fish	Toxicity to microorganisms	Toxicity to daphnia and other aquatic invertebrates
Naphtha (petroleum), heavy aromatic	2.5 mg/L EC50 72 h (Skeletonema costatum)	LC50 19 mg/L Pimephales promelas 96 h LC50 2.34 mg/L Oncorhynchus mykiss 96 h LC50 1740 mg/L Lepomis macrochirus 96 h LC50 45 mg/L Pimephales promelas 96 h LC50 41 mg/L Pimephales promelas 96 h		EC50 0.95 mg/L 48 h
Propylene carbonate	>500 mg/L EC50 72 h (Desmodesmus subspicatus)	LC50 5300 mg/L Leuciscus idus 96 h LC50 >1000 mg/L Cyprinus carpio 96 h	EC50 > 10000 mg/L 17 h	EC50 > >500 mg/L 48 h
Naphthalene	0.4 mg/L EC50 72 h (Skeletonema costatum)	LC50 5.74-6.44 mg/L Pimephales promelas 96 h LC50 1.6 mg/L Oncorhynchus mykiss 96 h LC50 0.91-2.82 mg/L Oncorhynchus mykiss 96 h LC50 1.99 mg/L Pimephales promelas 96 h LC50 31.0265 mg/L Lepomis macrochirus 96 h		LC50 2.16 mg/L 48 h EC50 1.96 mg/L 48 h EC50 1.09 - 3.4 mg/L 48 h
Isobutyl alcohol	230 mg/L EC50 48 h (Desmodesmus subspicatus)	LC50 1370-1670 mg/L Pimephales promelas 96 h LC50 375 mg/L Pimephales promelas 96 h LC50 1480-1730 mg/L Lepomis macrochirus 96 h LC50 1120-1520 mg/L Oncorhynchus mykiss 96 h	EC50 = 1224.6 mg/L 15 min	EC50 1300 mg/L 48 h EC50 1070 - 1933 mg/L 48 h

**Environmental Fate**

**Chlorpyrifos (2921-88-2)**

Active Ingredient(s)	Type of Test	Result
Chlorpyrifos	Bioconcentration factor (BCF)	100-3000
	log Pow	3-5
	Half-life in soil	30-60 days
	Stability in water	3-4 weeks



<b>Hazard Class</b>	6.1
<b>Subsidiary hazard class</b>	3
<b>Packing group</b>	III
<b>Marine pollutant</b>	Zeta-cypermethrin, Chlorpyrifos
<b>Description</b>	UN3017, Organophosphorus pesticides, liquid, toxic, flammable (Chlorpyrifos, Isobutyl alcohol), 6.1 (3), PG III, Marine Pollutant

**IMDG/IMO**

<b>Proper shipping name</b>	Organophosphorus pesticides, liquid, toxic, flammable
<b>Hazard Class</b>	6.1
<b>Subsidiary hazard class</b>	3
<b>UN/ID No</b>	UN3017
<b>Packing group</b>	III
<b>Marine pollutant</b>	Zeta-cypermethrin, Chlorpyrifos
<b>Description</b>	UN3017, Organophosphorus pesticides, liquid, toxic, flammable (Chlorpyrifos, Isobutyl alcohol), 6.1 (3), PG III, Marine Pollutant

**15. Regulatory information**

**U.S. Federal Regulations**

**SARA 313**

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product contains a chemical or chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

Chemical Name	CAS-No	Weight %	SARA 313 - Threshold Values %
Naphthalene	91-20-3	<4.5	0.1

**SARA 311/312 Hazard Categories**

<b>Acute Health Hazard</b>	yes
<b>Chronic Health Hazard</b>	yes
<b>Fire Hazard</b>	no
<b>Sudden Release of Pressure Hazard</b>	no
<b>Reactive Hazard</b>	no

**CERCLA**

This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302)

Chemical Name	Hazardous Substances RQs	Extremely Hazardous Substances RQs
Chlorpyrifos	1 lb	
Naphthalene	100 lb	
Isobutyl alcohol	5000 lb	

**TSCA Inventory (United States of America)**

Chemical Name	U.S. - TSCA (Toxic Substances Control Act) - Section 4 - Chemical Test Rules (40 CFR 799)	U.S. - TSCA (Toxic Substances Control Act) - Section 5(a)(2) - Chemicals with Significant New Use Rules (SNURs)
Naphthalene	40 CFR 799.5115	
Isobutyl alcohol	40 CFR 799.5000	

Chemical Name	U.S. - TSCA (Toxic Substances Control Act) - Section 8(a) - Chemical-Specific Reporting and Recordkeeping
Naphtha (petroleum), heavy aromatic	Partially exempt chemical substance termed Petroleum Process Stream
Naphthalene	PAIR: 08/04/1995

Chemical Name	U.S. - TSCA (Toxic Substances Control Act) - Section 8(d) - 716.120(a) - Health and Safety Reporting - List of Substances
Naphthalene	06/01/1987
Isobutyl alcohol	03/07/1986

**International Regulations**

**Mexico - Grade**

Moderate risk, Grade 2

Chemical Name	Carcinogen Status	Mexico
Chlorpyrifos		Mexico: S* Mexico: TWA 0.2 mg/m <sup>3</sup> Mexico: STEL 0.6 mg/m <sup>3</sup>
Naphthalene		Mexico: TWA 10 ppm Mexico: TWA 50 mg/m <sup>3</sup> Mexico: STEL 15 ppm Mexico: STEL 75 mg/m <sup>3</sup>
Isobutyl alcohol		Mexico: TWA 50 ppm Mexico: TWA 150 mg/m <sup>3</sup> Mexico: STEL 75 ppm Mexico: STEL 225 mg/m <sup>3</sup>

**Canada**

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

WHMIS Hazard Class

D1B Toxic materials

D2B Toxic materials



Component	NPRI
Isobutyl alcohol 78-83-1 ( 1-5 )	X

**16. Other information**

**Revision Date:** 2012-02-17  
**Reason for revision:** (M)SDS sections updated.

**Disclaimer**

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**End of Material Safety Data Sheet**