

# SAFETY DATA SHEET

Rugby® 200 CS

SDS # : 6044-A  
Revision date: 2015-02-02  
Format: NA  
Version 1



## 1. PRODUCT AND COMPANY IDENTIFICATION

### Product Identifier

**Product Name** Rugby® 200 CS

### Other means of identification

**Product Code(s)** 6044-A

**Synonyms** CADUSAFOS: S,S-di-sec-butyl O-ethyl phosphorodithioate; O-ethyl S,S-bis(1-methylpropyl) phosphorodithioate

**Active Ingredient(s)** Cadusafos

**Chemical Family** Organophosphate Pesticide

**Alternate Commercial Name** Apache®

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

**Recommended Use:** Insecticide, Nematicide

**Restrictions on Use:** Use as recommended by the label

### Manufacturer Address

FMC Corporation  
1735 Market Street  
Philadelphia, PA 19103  
(215) 299-6000 (General Information)  
msdsinfo@fmc.com (E-Mail General Information)

### Emergency telephone number

Medical Emergencies:  
1 800 / 331-3148 (PROSAR - U.S.A. & Canada)  
1 651 / 632-6793 (PROSAR - 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

### Classification

#### OSHA Regulatory Status

This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200)

Acute toxicity - Oral	Category 4
Acute toxicity - Inhalation (Dusts/Mists)	Category 4
Specific target organ toxicity (single exposure)	Category 1
Specific target organ toxicity (repeated exposure)	Category 1

**GHS Label elements, including precautionary statements**

**EMERGENCY OVERVIEW**

**Danger**

**Hazard Statements**

H302 - Harmful if swallowed  
H332 - Harmful if inhaled  
H370 - Causes damage to organs  
H372 - Causes damage to organs through prolonged or repeated exposure



**Precautionary Statements - Prevention**

P264 - Wash face, hands and any exposed 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  
P260 - Do not breathe dust/fume/gas/mist/vapors/spray

**Precautionary Statements - Response**

P321 - Specific treatment (see supplemental first aid instructions on this label)  
P308 + P311 - IF exposed or concerned: Call a POISON CENTER or doctor  
P304 + P340 - IF INHALED: Remove person to fresh air and keep comfortable for breathing  
P312 - Call a POISON CENTER or doctor if you feel unwell  
P301 + P312 - IF SWALLOWED: Call a POISON CENTER or doctor if you feel unwell  
P330 - Rinse mouth

**Precautionary Statements - Storage**

P405 - Store locked up

**Precautionary Statements - Disposal**

P501 - Dispose of contents/ container to an approved waste disposal plant

**Hazards not otherwise classified (HNOC)**

No hazards not otherwise classified were identified.

**Other Information**

Very toxic to aquatic life with long lasting effects

**3. COMPOSITION/INFORMATION ON INGREDIENTS**

**Chemical Family** Organophosphate Pesticide.

Chemical name	CAS-No	Weight %
Cadusafos	95465-99-9	18.4
2-Methylnaphthalene	91-57-6	<4
Naphtha (petroleum), heavy aromatic	64742-94-5	1-5
1,6-hexanediamine (70%)	124-09-4	1-5
1-Methylnaphthalene	90-12-0	<3
Phosphoric acid	7664-38-2	1-5

Synonyms are provided in Section 1.

**4. FIRST AID MEASURES**

<b>Eye Contact</b>	Hold eyes open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing. Call a poison control center or doctor for further treatment advice.
<b>Skin Contact</b>	Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for further treatment advice.
<b>Inhalation</b>	Move to fresh air. If person is not breathing, contact emergency medical services, then give artificial respiration, preferably mouth-to-mouth if possible. Call a poison control center or doctor for further treatment advice.
<b>Ingestion</b>	Call a poison control center or doctor immediately for treatment advice. Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by a poison control center or doctor. Do not give anything by mouth to an unconscious person.
<b>Most important symptoms and effects, both acute and delayed</b>	Symptoms of exposure may include headache, light-headedness, weakness, abdominal cramps, nausea, excessive salivation, perspiration, blurred vision, tearing, pin-point pupils, excessive respiratory secretions, cyanosis, convulsions, generalized tremor and coma.
<b>Indication of immediate medical attention and special treatment needed, if necessary</b>	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**

<b>Suitable Extinguishing Media</b>	Foam. Carbon dioxide (CO <sub>2</sub> ). Dry powder. Water spray.
<b>Specific Hazards Arising from the Chemical</b>	. Combustible liquid
<b>Explosion data</b>	
<b>Sensitivity to Mechanical Impact</b>	Not sensitive.
<b>Sensitivity to Static Discharge</b>	Not sensitive.
<b>Protective equipment and precautions for firefighters</b>	Wear self-contained breathing apparatus and protective suit.

**6. ACCIDENTAL RELEASE MEASURES**

<b>Personal Precautions</b>	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.
<b>Other</b>	For further clean-up instructions, call FMC Emergency Hotline number listed in Section 1 "Product and Company Identification" above.
<b>Environmental Precautions</b>	Keep people and animals away from and upwind of spill/leak. Keep material out of lakes, streams, ponds, and sewer drains.
<b>Methods for Containment</b>	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.

## 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. Keep/store only in original container.

**Incompatible products**

None known

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

**Control parameters****Exposure Guidelines**

Chemical name	ACGIH TLV	OSHA PEL	NIOSH	Mexico
2-Methylnaphthalene 91-57-6	S* TWA: 0.5 ppm	-	-	-
1,6-hexanediamine (70%) 124-09-4	TWA: 0.5 ppm	-	-	-
1-Methylnaphthalene 90-12-0	S* TWA: 0.5 ppm	-	-	-
Phosphoric acid 7664-38-2	STEL 3 mg/m <sup>3</sup> TWA: 1 mg/m <sup>3</sup>	TWA: 1 mg/m <sup>3</sup>	IDLH: 1000 mg/m <sup>3</sup> TWA: 1 mg/m <sup>3</sup> STEL: 3 mg/m <sup>3</sup>	Mexico: TWA 1 mg/m <sup>3</sup> Mexico: STEL 3 mg/m <sup>3</sup>
Chemical name	British Columbia	Quebec	Ontario TWA/EV	Alberta
2-Methylnaphthalene 91-57-6	TWA: 0.5 ppm Skin	-	TWA: 0.5 ppm Skin	-
1,6-hexanediamine (70%) 124-09-4	TWA: 0.5 ppm	TWA: 0.5 ppm TWA: 2.3 mg/m <sup>3</sup>	TWA: 0.5 ppm	TWA: 0.5 ppm TWA: 2.4 mg/m <sup>3</sup>
1-Methylnaphthalene 90-12-0	TWA: 0.5 ppm Skin	-	TWA: 0.5 ppm Skin	-
Phosphoric acid 7664-38-2	TWA: 1 mg/m <sup>3</sup> STEL: 3 mg/m <sup>3</sup>	TWA: 1 mg/m <sup>3</sup> STEL: 3 mg/m <sup>3</sup>	TWA: 1 mg/m <sup>3</sup> STEL: 3 mg/m <sup>3</sup>	TWA: 1 mg/m <sup>3</sup> STEL: 3 mg/m <sup>3</sup>

**Appropriate engineering 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.

**Individual protection measures, such as personal protective equipment****Eye/Face Protection**

For dust, splash, mist or spray exposure, wear chemical protective goggles.

**Skin and Body Protection**

Wear long-sleeved shirt, long pants, socks, and shoes.

**Hand Protection**

Protective gloves

**Respiratory Protection**

For dust, splash, mist or spray exposures wear a filtering mask.

**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.

**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.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

**Information on basic physical and chemical properties**

Appearance	Suspension
Physical State	Liquid
Color	Green
Odor	Slight mercaptan
Odor threshold	No information available
pH	7.4-7.9
Melting point/freezing point	Not applicable
Boiling Point/Range	No information available
Flash point	89-92 °C / 192-198 °F Tag Closed Cup
Evaporation Rate	No information available
Flammability (solid, gas)	No information available
Flammability Limit in Air	
Upper flammability limit:	No information available
Lower flammability limit:	No information available
Vapor pressure	No information available
Vapor density	No information available
Density	No information available
Specific gravity	1.05-1.07
Water solubility	No information available
Solubility in other solvents	No information available
Partition coefficient	No information available
Autoignition temperature	No information available
Decomposition temperature	No information available
Viscosity, kinematic	No information available
Viscosity, dynamic	No information available
Explosive properties	No information available
Oxidizing properties	No information available
Molecular weight	No information available
Bulk density	8.75 - 8.91 lb/gal

## 10. STABILITY AND REACTIVITY

Reactivity	Not applicable
Chemical Stability	Stable.
Possibility of Hazardous Reactions	None under normal processing.
Hazardous polymerization	Hazardous polymerization does not occur.
Conditions to avoid	Keep away from open flames, hot surfaces and sources of ignition.
Incompatible materials	None known.
Hazardous Decomposition Products	Carbon oxides (COx), Phosphorous oxides, Sulfur dioxide.

## 11. TOXICOLOGICAL INFORMATION

**Product Information**

LD50 Oral	1,097 mg/kg (rat)
LD50 Dermal	> 5,000 mg/kg (rat)
LC50 Inhalation	> 3.87 mg/L 4 hr (rat)
Serious eye damage/eye irritation	Minimally irritating (rabbit).
Skin corrosion/irritation	Non-irritating.

**Sensitization**

Non-sensitizing.

**Information on toxicological effects****Symptoms**

This substance 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. Excessive cholinesterase inhibition may result in death. Reduction of blood acetylcholinesterase levels can occur without symptoms of toxicity.

**Delayed and immediate effects as well as chronic effects from short and long-term exposure****Chronic toxicity**

Cadusafos: Prolonged exposure caused inhibition of red blood cell and brain cholinesterase, and decreased motor activity.

**Mutagenicity**

Cadusafos:

Not genotoxic in laboratory studies.

**Carcinogenicity**

Cadusafos: No evidence of carcinogenicity from animal studies.

**Neurological effects**

Cadusafos: Chronic exposure to animals caused decreased motor activity and decreased cholinesterase activity in brain, red blood cells and plasma.

**Reproductive toxicity**

Cadusafos: No toxicity to reproduction in animal studies.

**Developmental toxicity**

Cadusafos: Not teratogenic in animal studies.

**STOT - single exposure**

Causes damage to organs. See listed target organs below.

**STOT - repeated exposure**

Causes damage to organs through prolonged or repeated exposure. See listed target organs below.

**Target organ effects**

Central Nervous System (CNS), Peripheral Nervous System (PNS).

**Neurological effects**

Cadusafos: Chronic exposure to animals caused decreased motor activity and decreased cholinesterase activity in brain, red blood cells and plasma.

**Aspiration hazard**

No information available.

## 12. ECOLOGICAL INFORMATION

**Ecotoxicity**

<b>Cadusafos (95465-99-9)</b>				
Active Ingredient(s)	Duration	Species	Value	Units
Cadusafos	48 h EC50	Crustacea	1.6	µg/L
	96 h LC50	Fish	0.13	mg/L
	72 h EC50	Algae	4.3	mg/L
	21 d NOEC	Crustacea	0.23	µg/L
	21 d NOEC	Fish	5.2	µg/L
	96 h NOEC	Algae	1.0	mg/L

Chemical name	Toxicity to algae	Toxicity to fish	Toxicity to daphnia and other aquatic invertebrates
Naphtha (petroleum), heavy aromatic 64742-94-5		96 h 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)	48 h EC50: 0.95 mg/L (Daphnia magna)

1,6-hexanediamine (70%) 124-09-4	72 h EC50: 15 mg/L (EC50) 96 h EC50: 14.8 mg/L (EC50)	96 h LC50: > 56 mg/L (Lepomis macrochirus) 96 h LC50: = 1825 mg/L (Pimephales promelas)	48 h EC50: 23.4 mg/L (Daphnia magna)
-------------------------------------	--	--	---

**Persistence and degradability** Cadusafos: Moderately persistent. Does not readily hydrolyze. Not readily biodegradable.

**Bioaccumulation** Cadusafos: The substance does not have a potential for bioconcentration.

**Mobility** Cadusafos: Moderately mobile; Has some potential to reach groundwater.

### 13. DISPOSAL CONSIDERATIONS

**Waste disposal methods** Improper disposal of excess pesticide, spray mixture, or rinsate is prohibited. If these wastes cannot be disposed of by use according to label instructions, contact appropriate disposal authorities for guidance.

**Contaminated Packaging** Do not reuse or refill this container. Containers must be disposed of in accordance with local, state and federal regulations. Refer to the product label for container disposal instructions.

Chemical name	California Hazardous Waste Status
1,6-hexanediamine (70%) 124-09-4	Toxic
Phosphoric acid 7664-38-2	Corrosive

### 14. TRANSPORT INFORMATION

**DOT** This material is a Combustible liquid and is, therefore, not subject to the hazardous materials regulations when in non-bulk packages shipped within the USA per 49 CFR §173.150(f)(2).

**UN/ID no** NA1993  
**Proper Shipping Name** Combustible liquid, n.o.s  
**Hazard class** Combustible  
**Packing Group** III  
**Description** NA1993, Combustible liquid, n.o.s. (aromatic hydrocarbons), PGIII

**TDG** The "Marine Pollutant" marking is only applicable when shipped by vessel, and is not applicable when shipped only by road or rail in Canada.

**UN/ID no** UN3082  
**Proper Shipping Name** Environmentally hazardous substance, liquid, n.o.s.  
**Hazard class** 9  
**Packing Group** III  
**Marine Pollutant** Cadusafos.  
**Description** UN3082 Environmentally hazardous substance, liquid, n.o.s. (Cadusafos), 9, PG III, Marine Pollutant

**ICAO/IATA**

**UN/ID no** UN3082  
**Proper Shipping Name** Environmentally hazardous substance, liquid, n.o.s.  
**Hazard class** 9  
**Packing Group** III  
**Description** UN3082 Environmentally hazardous substance, liquid, n.o.s. (Cadusafos), 9, PG III, Marine Pollutant

**IMDG/IMO**

**UN/ID no** UN3082  
**Proper Shipping Name** Environmentally hazardous substance, liquid, n.o.s.

<b>Hazard class</b>	9
<b>Packing Group</b>	III
<b>EmS No.</b>	F-A, S-F
<b>Marine Pollutant</b>	Cadusafos
<b>Description</b>	UN3082 Environmentally hazardous substance, liquid, n.o.s. (Cadusafos), 9, 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 %
Methylene diphenyl diisocyanate (polymeric) - 9016-87-9	9016-87-9	5-10	1.0

#### SARA 311/312 Hazard Categories

Acute health hazard	Yes
Chronic health hazard	Yes
Fire hazard	Yes
Sudden release of pressure hazard	No
Reactive Hazard	No

#### Clean Water Act

Chemical name	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants	CWA - Hazardous Substances
Phosphoric acid 7664-38-2	5000 lb			X

#### CERCLA

Chemical name	Hazardous Substances RQs	Extremely Hazardous Substances RQs	RQ
Phosphoric acid 7664-38-2	5000 lb		RQ 5000 lb final RQ RQ 2270 kg final RQ

### US State Regulations

#### California Proposition 65

This product contains the following Proposition 65 chemicals:.

Chemical name	California Prop. 65
Methyl alcohol - 67-56-1	Developmental
Naphthalene - 91-20-3	Carcinogen

#### U.S. State Right-to-Know Regulations

Chemical name	New Jersey	Massachusetts	Pennsylvania
2-Methylnaphthalene 91-57-6	X		
Methylene diphenyl diisocyanate (polymeric) 9016-87-9	X		
1,6-hexanediamine (70%) 124-09-4	X	X	



1-Methylnaphthalene 90-12-0	X	X	X
Phosphoric acid 7664-38-2	X	X	X

**FIFRA Information**

*This chemical is a pesticide product registered by the Environmental Protection Agency and is subject to certain labeling requirements under federal pesticide law. These requirements differ from the classification criteria and hazard information required for safety data sheets, and for workplace labels of non-pesticide chemicals. Following is the hazard information as required on the pesticide label:*

**International Inventories**

Component	TSCA (United States)	DSL (Canada)	EINECS/ELI NCS (Europe)	ENCS (Japan)	China (IECSC)	KECL (Korea)	PICCS (Philippines)	AICS (Australia)
Cadusafos 95465-99-9 ( 18.4 )	X					X		
2-Methylnaphthalene 91-57-6 ( <4 )	X	X	X	X	X		X	X
Naphtha (petroleum), heavy aromatic 64742-94-5 ( 1-5 )	X	X	X	X	X	X	X	X
1,6-hexanediamine (70%) 124-09-4 ( 1-5 )	X	X	X	X	X	X	X	X
1-Methylnaphthalene 90-12-0 ( <3 )	X	X	X	X	X		X	X
Phosphoric acid 7664-38-2 ( 1-5 )	X	X	X	X	X	X	X	X

**Mexico - Grade**

Moderate risk, Grade 2

**WHMIS Hazard Class**

B3 - Combustible liquid  
D2A - Very toxic materials

**16. OTHER INFORMATION**

NFPA	Health Hazards 2	Flammability 2	Instability 0	Special Hazards -
HMIS	Health Hazards 2*	Flammability 2	Physical hazard 0	Personal Protection X

Revision date:  
Revision note

2015-02-02  
(M)SDS sections updated

**Disclaimer**

FMC Corporation believes that the information and recommendations contained herein (including data and statements) are accurate as of the date hereof. NO WARRANTY OF FITNESS FOR ANY PARTICULAR PURPOSE, WARRANTY OF MERCHANTABILITY OR ANY OTHER WARRANTY, EXPRESSED OR IMPLIED, IS MADE CONCERNING THE INFORMATION PROVIDED HEREIN. The information provided herein relates only to the specified product designated and may not be applicable where such product is used in combination with any other materials or in any process. Use of this product is regulated by the U.S. Environmental Protection Agency (EPA). It is a violation of Federal law to use this product in a manner inconsistent with its labeling. Further, since the conditions and methods of use are beyond the control of FMC Corporation, FMC corporation expressly disclaims any and all liability as to any results obtained or arising from any use of the products or reliance on such information.

**Prepared By:**

FMC Corporation  
FMC Logo and Rugby - Trademarks of FMC Corporation

© 2015 FMC Corporation. All Rights Reserved.

**End of Safety Data Sheet**