



Material Safety Data Sheet
ARMADA™ 50 WDG FUNGICIDE

MSDS Number: 102000024286
MSDS Version 1.0
Revision Date: 04/12/2011
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SECTION 1. CHEMICAL PRODUCT AND COMPANY INFORMATION

Product name ARMADA™ 50 WDG FUNGICIDE
MSDS Number 102000024286

Bayer Environmental Science
2 T.W. Alexander Drive
Research Triangle PK, NC 27709
USA

For MEDICAL, TRANSPORTATION or other EMERGENCY call: 1-800-334-7577 (24 hours/day)
For Product Information call: 1-800-331-2867

SECTION 2. HAZARDS IDENTIFICATION

NOTE: Please refer to Section 11 for detailed toxicological information.

Emergency Overview Caution! Moderate eye irritation. Harmful if swallowed, inhaled or absorbed through the skin. Prolonged or frequently repeated skin contact may cause allergic reactions in some individuals. Avoid breathing dust or spray mist. Avoid contact with skin, eyes and clothing.

Physical State water-dispersible granules

Appearance brown

Exposure routes Eye contact, Skin contact, Inhalation, Ingestion

Immediate Effects

Eye May cause mild irritation to eyes. Avoid contact with eyes.

Skin May cause skin irritation. Prolonged or frequently repeated skin contact may cause allergic reactions in some individuals. Avoid contact with skin and clothing.

Ingestion Harmful if swallowed. Do not take internally.

Inhalation Harmful if inhaled. Avoid breathing dust or spray mist.

Chronic or Delayed Long-Term

This product contains ingredients that are considered to be probable or suspected human carcinogens (see Section 11 - Chronic). This product or its components may have target organ effects.



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Medical Conditions Aggravated by Exposure No specific medical conditions are known which may be aggravated by exposure to this product. As with all materials which can cause upper respiratory tract irritation, persons with a history of asthma, emphysema, or hyperreactive airways disease may be more susceptible to overexposure. Pulmonary and respiratory diseases may be aggravated by exposure to respirable crystalline silica.

Potential Environmental Effect Toxic to fish and aquatic invertebrates.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

<u>Hazardous Component Name</u>	<u>CAS-No.</u>	<u>Average % by Weight</u>
Triadimefon	43121-43-3	41.67
Trifloxystrobin	141517-21-7	8.33
Quartz (Silica, Crystalline)	14808-60-7	0.36
Silica, amorphe	7631-86-9	

SECTION 4. FIRST AID MEASURES

General When possible, have the product container or label with you when calling a poison control center or doctor or going for treatment.

Eye Hold eye 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 eye. Call a physician or poison control center immediately.

Skin Take off contaminated clothing and shoes immediately. Wash off immediately with plenty of water for at least 15 minutes. Call a physician or poison control center immediately.

Ingestion Call a physician or poison control center immediately. Rinse out mouth and give water in small sips to drink. DO NOT induce vomiting unless directed to do so by a physician or poison control center. Never give anything by mouth to an unconscious person. Do not leave victim unattended.

Inhalation Move 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 physician or poison control center immediately.

Notes to physician Treatment Appropriate supportive and symptomatic treatment as indicated by the patient's condition is recommended. There is no specific antidote.



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SECTION 5. FIRE FIGHTING MEASURES

Flash point	not applicable
Autoignition temperature	no data available
Lower Flammability Limit	not applicable
Upper Flammability Limit	not applicable
Explosiveness	no data available
Suitable extinguishing media	Carbon dioxide (CO2), Dry chemical, Foam
Fire Fighting Instructions	<p>Keep out of smoke. Fight fire from upwind position. Cool closed containers exposed to fire with water spray. Do not allow run-off from fire fighting to enter drains or water courses.</p> <p>Firefighters should wear NIOSH approved self-contained breathing apparatus and full protective clothing.</p>
Dust Explosion Class	no data available

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions	Avoid contact with spilled product or contaminated surfaces. Avoid dust formation. Do not breathe dust. Use personal protective equipment.
Methods for cleaning up	Sweep up or vacuum up spillage and collect in suitable container for disposal. Avoid dust formation. Clean contaminated floors and objects thoroughly, observing environmental regulations. Decontaminate tools and equipment following cleanup.
Additional advice	<p>Do not allow to enter soil, waterways or waste water canal. Do not allow product to contact vegetation.</p> <p>Information regarding safe handling, see section 7. Information regarding personal protective equipment, see section 8. Information regarding waste disposal, see section 13.</p>

SECTION 7. HANDLING AND STORAGE

Handling procedures	Handle and open container in a manner as to prevent spillage. Maintain exposure levels below the exposure limit through the use of general and local exhaust ventilation.
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Keep away from heat and sources of ignition.

Storing Procedures

Store in a cool, dry place and in such a manner as to prevent cross contamination with other crop protection products, fertilizers, food, and feed. Store in original container and out of the reach of children, preferably in a locked storage area. Protect from freezing. Protect against moisture.

Work/Hygienic Procedures

Handle in accordance with good industrial hygiene and safety practice. Wash hands thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco, using the toilet or applying cosmetics.

Remove Personal Protective Equipment (PPE) immediately after handling this product. Before removing gloves clean them with soap and water. Remove soiled clothing immediately and clean thoroughly before using again. Wash thoroughly and put on clean clothing.

SECTION 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

General Protection

Follow all label instructions. Train employees in safe use of the product.

Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables, use detergent and warm/tepid water. Keep and wash PPE separately from other laundry.

Eye/Face Protection

Chemical resistant goggles must be worn.

Hand protection

Chemical resistant nitrile rubber gloves

Body Protection

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

Respiratory protection

When respirators are required, select NIOSH approved equipment based on actual or potential airborne concentrations and in accordance with the appropriate regulatory standards and/or industry recommendations.

Exposure Limits

Triadimefon	43121-43-3	OES BCS*	TWA	0.7 mg/m3
		TX ESL	ST ESL	100 ug/m3
		TX ESL	AN ESL	10 ug/m3
Trifloxystrobin Quartz (Silica, Crystalline)	141517-21-7	OES BCS*	TWA	2.7 mg/m3
		14808-60-7	ACGIH	TWA
		NIOSH	REL	0.05 mg/m3
		OSHA Z1A	TWA	0.1 mg/m3
		Z3	TWA	2.4 millions of particles per cubic foot of air
	Z3	TWA	0.1 mg/m3	



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		Z3	TWA	0.3 mg/m3
		US CA OEL	TWA PEL	0.1 mg/m3
		US CA OEL	TWA PEL	0.3 mg/m3
		TX ESL	ST ESL	1 ug/m3
		TX ESL	ST ESL	1 ug/m3
		TX ESL	AN ESL	0.1 ug/m3
		TX ESL	AN ESL	0.1 ug/m3
		TX ESL	ST ESL	10 ug/m3
		TX ESL	AN ESL	1 ug/m3
			TWA	0.1 mg/m3
Silica, amorphe	7631-86-9	OSHA Z1A	TWA	6 mg/m3
		TX ESL	ST ESL	40 ug/m3
		TX ESL	AN ESL	4 ug/m3
		Z3	TWA	20 millions of particles per cubic foot of air
		Z3	TWA	0.8 mg/m3
		NIOSH	REL	6 mg/m3
		TX ESL	ST ESL	10 ug/m3
		TX ESL	AN ESL	1 ug/m3

*OES BCS: Internal Bayer CropScience "Occupational Exposure Standard"

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	brown
Physical State	water-dispersible granules
Vapor Pressure	not applicable
Vapor Density (Air = 1)	not applicable
Bulk density	32 - 38 lb/ft ³
Evaporation rate	no data available
Melting / Freezing Point	no data available
Minimum Ignition Energy	no data available
Decomposition temperature	no data available
Partition coefficient: n-octanol/water	not applicable

SECTION 10. STABILITY AND REACTIVITY



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Conditions to avoid	Heat, flames and sparks. freezing Exposure to moisture.
Incompatibility	Strong oxidizing agents Acids
Hazardous Decomposition Products	Thermal decomposition Hydrogen chloride (HCl) Amines nitrogen oxides (NOx) Carbon monoxide
Chemical Stability	Stable under normal conditions.

SECTION 11. TOXICOLOGICAL INFORMATION

Acute toxicity studies have not been performed on this product as formulated. The acute toxicity data provided has been bridged from a similar formulation containing the active ingredients, Triadimefon and Trifloxystrobin. The non-acute information pertains to the technical-grade active ingredients.

Acute oral toxicity	rat: > 500 - 5,000 mg/kg
Acute dermal toxicity	rat: > 2,000 - 5,000 mg/kg
Acute inhalation toxicity	rat: LC50: > 0.5 - 2.0 mg/l Exposure time: 4 h Determined in the form of a respirable fine dust. male/female combined rat: LC50: > 2.0 - 8.0 mg/l Exposure time: 1 h Determined in the form of a respirable fine dust. Extrapolated from the 4 hr LC50.
Skin irritation	rabbit: Moderate skin irritation.
Eye irritation	rabbit: Mild eye irritation.
Sensitisation	guinea pig: May cause sensitization by skin contact.
Chronic toxicity	TRIADIMEFON: Triadimefon affected the liver and/or thyroid (secondary effects) in chronic studies in rats and dogs. TRIFLOXYSTROBIN: Trifloxystrobin caused liver effects in chronic studies in mice, rats and/or dogs.

Assessment Carcinogenicity



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TRIADIMEFON: Triadimefon has been classified by EPA as a Group C (possible human carcinogen) based on borderline statistically significant increases in thyroid adenomas in male rats, and increases in liver adenomas in both sexes in mice. The Agency used a non-linear methodology approach for determining the Margin of Exposure (MOE) for the estimation of human cancer risk because the tumors were benign, and there were no apparent genotoxicity concerns. Therefore, EPA has a reasonable certainty that no harm will result from exposure to residues of triadimefon.

TRIFLOXYSTROBIN: Trifloxystrobin was not carcinogenic in lifetime feeding studies in rats and mice.

ACGIH

Quartz (Silica, Crystalline)	14808-60-7	Group A2
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NTP

None.

IARC

Quartz (Silica, Crystalline)	14808-60-7	Overall evaluation: 1
Silica, amorphe	7631-86-9	Overall evaluation: 3

OSHA

None.

Reproductive toxicity

TRIADIMEFON TECHNICAL
REPRODUCTION: Triadimefon caused reproductive effects (e.g., smaller litter sizes) in conjunction with parental toxicity at the highest dose tested in reproduction studies in rats.

DEVELOPMENTAL TOXICITY: Triadimefon is not considered a primary developmental toxicant in laboratory animals. Developmental effects were observed only at doses that caused maternal toxicity.

TRIFLOXYSTROBIN TECHNICAL
REPRODUCTION: Trifloxystrobin is not considered a primary reproductive toxicant in rats.

DEVELOPMENTAL TOXICITY: Trifloxystrobin is not considered a primary developmental toxicant in laboratory animals. Developmental effects were observed only at doses that caused maternal toxicity.

Assessment neurotoxicity

TRIADIMEFON: Triadimefon caused prominent hyperactivity-related neurobehavioral changes in acute (oral gavage) and subchronic (diet) neurotoxicity screening studies in rats. There were no neuropathologic alterations in the skeletal muscle or neural tissues in either study.

TRIFLOXYSTROBIN: Trifloxystrobin is not a primary neurotoxicant based on an acute (oral gavage) neurotoxicity screening study in rats.

Mutagenicity

TRIADIMEFON: Triadimefon is not considered genotoxic or mutagenic based on in vitro and in vivo mutagenicity studies.

TRIFLOXYSTROBIN: Trifloxystrobin was not considered mutagenic or genotoxic based on in vitro and in vivo tests.



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SECTION 12. ECOLOGICAL INFORMATION

Environmental precautions Do not apply directly to water, to areas where surface water is present or to intertidal areas below the mean high water mark. Do not contaminate surface or ground water by cleaning equipment or disposal of wastes, including equipment wash water. Do not allow to get into surface water, drains and ground water.

SECTION 13. DISPOSAL CONSIDERATIONS

General Disposal Guidance Do not contaminate water, food, or feed by disposal. Dispose in accordance with all local, state/provincial and federal regulations. Follow advice on product label and/or leaflet.

Container Disposal Do not re-use empty containers. Triple rinse containers. Completely empty container into application equipment, then dispose of empty container in a sanitary landfill, by incineration or by other procedures approved by state/provincial and local authorities. If burned, stay out of smoke. Follow advice on product label and/or leaflet.

RCRA Information Characterization and proper disposal of this material as a special or hazardous waste is dependent upon Federal, State and local laws and are the user's responsibility. RCRA classification may apply.

SECTION 14. TRANSPORT INFORMATION

49CFR Not dangerous goods / not hazardous material

IMDG

UN-Number **3077**
Class 9
Packaging group III
Marine pollutant YES
Description of the goods ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (TRIFLOXYSTROBIN, TRIADIMEFON MIXTURE)

IATA

UN-Number **3077**
Class 9
Packaging group III
Environm. Hazardous Mark YES
Description of the goods ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (TRIFLOXYSTROBIN, TRIADIMEFON MIXTURE)

This transportation information is not intended to convey all specific regulatory information relating to this product. It does not address regulatory variations due to package size or special transportation



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requirements.

SECTION 15. REGULATORY INFORMATION

US Federal Regulations

TSCA list

Quartz (Silica, Crystalline)	14808-60-7
Silica, amorphe	7631-86-9

US. Toxic Substances Control Act (TSCA) Section 12(b) Export Notification (40 CFR 707, Subpt D)

None.

SARA Title III - Section 302 - Notification and Information

None.

SARA Title III - Section 313 - Toxic Chemical Release Reporting

Triadimefon	43121-43-3	1.0%
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US States Regulatory Reporting

CA Prop65

This product does not contain any substances known to the State of California to cause cancer.

This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.

Triadimefon	43121-43-3	Male reproductive toxin.
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US State Right-To-Know Ingredients

Triadimefon	43121-43-3	NJ
Quartz (Silica, Crystalline)	14808-60-7	IL, MA
Silica, amorphe	7631-86-9	CA, MN

Canadian Regulations

Canadian Domestic Substance List

Quartz (Silica, Crystalline)	14808-60-7
Silica, amorphe	7631-86-9

Environmental

CERCLA

None.

Clean Water Section 307 Priority Pollutants

None.

Safe Drinking Water Act Maximum Contaminant Levels

None.

International Regulations

European Inventory of Existing Commercial Substances (EINECS)

Triadimefon	43121-43-3
Quartz (Silica, Crystalline)	14808-60-7
Silica, amorphe	7631-86-9



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SECTION 16. OTHER INFORMATION

NFPA 704 (National Fire Protection Association):

Health - 2 Flammability - 1 Reactivity - 1 Others -

HMIS (Hazardous Materials Identification System, based on the Third Edition Ratings Guide)

Health - 2 Flammability - 1 Physical Hazard - 1 PPE -

0 = minimal hazard, 1 = slight hazard, 2 = moderate hazard, 3 = severe hazard, 4 = extreme hazard

Reason for Revision: New Material Safety Data Sheet.

Revision Date: 04/12/2011

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