



**Material Safety Data Sheet**  
**ARMADA™ 50 WDG FUNGICIDE**

MSDS Number: 102000024286  
MSDS Version 1.0  
Revision Date: 04/12/2011  
Print Date: 04/15/2011

**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**

<b>Flash point</b>	not applicable
<b>Autoignition temperature</b>	no data available
<b>Lower Flammability Limit</b>	not applicable
<b>Upper Flammability Limit</b>	not applicable
<b>Explosiveness</b>	no data available
<b>Suitable extinguishing media</b>	Carbon dioxide (CO2), Dry chemical, Foam
<b>Fire Fighting Instructions</b>	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.  Firefighters should wear NIOSH approved self-contained breathing apparatus and full protective clothing.
<b>Dust Explosion Class</b>	no data available

**SECTION 6. ACCIDENTAL RELEASE MEASURES**

<b>Personal precautions</b>	Avoid contact with spilled product or contaminated surfaces. Avoid dust formation. Do not breathe dust. Use personal protective equipment.
<b>Methods for cleaning up</b>	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.
<b>Additional advice</b>	Do not allow to enter soil, waterways or waste water canal. Do not allow product to contact vegetation.  Information regarding safe handling, see section 7. Information regarding personal protective equipment, see section 8. Information regarding waste disposal, see section 13.

**SECTION 7. HANDLING AND STORAGE**

<b>Handling procedures</b>	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**

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

**SECTION 10. STABILITY AND REACTIVITY**



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

<b>Acute oral toxicity</b>	rat: > 500 - 5,000 mg/kg
<b>Acute dermal toxicity</b>	rat: > 2,000 - 5,000 mg/kg
<b>Acute inhalation toxicity</b>	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.
<b>Skin irritation</b>	rabbit: Moderate skin irritation.
<b>Eye irritation</b>	rabbit: Mild eye irritation.
<b>Sensitisation</b>	guinea pig: May cause sensitization by skin contact.
<b>Chronic toxicity</b>	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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