



Material Safety Data Sheet

ARMADA® 50WP FUNGICIDE

MSDS Number: 102000011765
MSDS Version 2.0
Revision Date: 06/17/2011
Print Date: 06/17/2011

SECTION 1. CHEMICAL PRODUCT AND COMPANY INFORMATION

Product name ARMADA® 50WP FUNGICIDE
MSDS Number 102000011765
EPA Registration No. 432-1412
Product Use Fungicide

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 powder

Odor characteristic

Appearance white to grey

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.



Material Safety Data Sheet

MSDS Number: 102000011765
MSDS Version 2.0

ARMADA® 50WP FUNGICIDE

Chronic or Delayed Long-Term

This product is not listed as a carcinogen by ACGIH, NTP, IARC or OSHA. However, it may contain crystalline silica (quartz), a substance which has been listed as a carcinogen by ACGIH, NTP and IARC. Crystalline silica is a naturally-occurring mineral component of many sands and clays. Although the carcinogenic potential of crystalline silica in humans is controversial, it must be considered if it is inhaled under excessive exposure conditions. The respirable portion of the silica that may be contained in this product, however, is small, such that inhalation exposure during anticipated conditions of use is minimal. This product or its components may have target organ effects. This product or its components may have long term (chronic) health effects.

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	0.38
Crystalline quartz (respirable)		
Sodium lignosulphonate	8061-51-6	6.67
Sodium dodecylbenzenesulfonate	25155-30-0	1.53

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



Material Safety Data Sheet

ARMADA® 50WP FUNGICIDE

MSDS Number: 102000011765
MSDS Version 2.0

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.

SECTION 5. FIRE FIGHTING MEASURES

Flash point not applicable

Autoignition temperature no data available

Lower Flammability Limit no data available

Upper Flammability Limit no data available

Suitable extinguishing media Carbon dioxide (CO2), Dry chemical, Foam

Fire Fighting Instructions 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.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions Avoid contact with spilled product or contaminated surfaces. Isolate hazard area. Keep unauthorized people away.

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 Use personal protective equipment. Do not allow to enter soil, waterways or waste water canal. Do not allow product to contact vegetation.

SECTION 7. HANDLING AND STORAGE

Handling procedures Handle and open container in a manner as to prevent spillage. Maintain



Material Safety Data Sheet

MSDS Number: 102000011765
MSDS Version 2.0

ARMADA® 50WP FUNGICIDE

exposure levels below the exposure limit through the use of general and local exhaust ventilation.

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

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	141517-21-7	OES BCS*	TWA	2.7 mg/m3
Quartz (Silica, Crystalline)	14808-60-7	ACGIH	TWA	0.025 mg/m3
		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



Material Safety Data Sheet

ARMADA® 50WP FUNGICIDE

MSDS Number: 102000011765
MSDS Version 2.0

		Z3	TWA	0.1 mg/m3
		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
Kaolin	1332-58-7	ACGIH	TWA	2 mg/m3
		NIOSH	REL	5 mg/m3
		NIOSH	REL	10 mg/m3
		US CA OEL	TWA PEL	2 mg/m3
		TX ESL	ST ESL	20 ug/m3
		TX ESL	AN ESL	2 ug/m3
		TX ESL	ST ESL	20 ug/m3
		TX ESL	AN ESL	2 ug/m3
			TWA	10 mg/m3
			TWA	5 mg/m3
Sodium dodecylbenzenesulfonate	25155-30-0	TX ESL	ST ESL	100 ug/m3
		TX ESL	ST ESL	1000 ug/m3
		TX ESL	AN ESL	100 ug/m3
		TX ESL	AN ESL	10 ug/m3

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

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	white to grey
Physical State	powder
Odor	characteristic
pH	7.5 - 9.0 at 25 °C (as aqueous solution)
Vapor Pressure	no data available
Vapor Density (Air = 1)	no data available
Bulk density	233 kg/m3
Evaporation rate	no data available



Material Safety Data Sheet

ARMADA® 50WP FUNGICIDE

MSDS Number: 102000011765
MSDS Version 2.0

Boiling Point	no data available
Melting / Freezing Point	no data available
Water solubility	no data available
Minimum Ignition Energy	no data available
Decomposition temperature	no data available
Partition coefficient: n-octanol/water	no data available

SECTION 10. STABILITY AND REACTIVITY

Conditions to avoid	Heat, flames and sparks. Exposure to moisture. freezing
Incompatibility	Strong oxidizing agents Acids
Hazardous Decomposition Products	Thermal decomposition Hydrogen chloride (HCl) Amines nitrogen oxides (NOx) Carbon monoxide
Hazardous reactions	No hazardous reactions when stored and handled according to prescribed instructions.
Chemical Stability	Stable under normal conditions.

SECTION 11. TOXICOLOGICAL INFORMATION

Acute toxicity studies have not been performed on this product as formulated. Acute toxicity data has been bridged from similar formulations 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



Material Safety Data Sheet

MSDS Number: 102000011765
MSDS Version 2.0

ARMADA® 50WP FUNGICIDE

Acute inhalation toxicity rat: LC50: > 0.5 - 2.0 mg/l
Exposure time: 4 h
Determined in the form of dust.

rat: LC50: > 2.0 - 8.0 mg/l
Exposure time: 1 h
Determined in the form of 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 affected the liver and/or thyroid (secondary effects) in chronic studies in rats and dogs.

Trifloxystrobin caused liver effects in chronic studies in mice, rats and/or dogs.

Assessment Carcinogenicity

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 was not carcinogenic in lifetime feeding studies in rats and mice.

ACGIH

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

NTP

Crystalline quartz (respirable)

IARC

Quartz (Silica, Crystalline)	14808-60-7	Overall evaluation: 1
------------------------------	------------	-----------------------

OSHA

None.

Reproductive toxicity 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.

Trifloxystrobin is not considered a primary reproductive toxicant 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.



Material Safety Data Sheet

MSDS Number: 102000011765
MSDS Version 2.0

ARMADA® 50WP FUNGICIDE

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

Mutagenicity

Triadimefon is not considered genotoxic based on a battery of in vitro and in vivo tests.

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

SECTION 12. ECOLOGICAL INFORMATION

Toxicity to fish

Rainbow trout (*Oncorhynchus mykiss*)
LC50: 4.08 mg/l
Exposure time: 96 h
The value mentioned relates to the active ingredient triadimefon.

Rainbow trout (*Oncorhynchus mykiss*)
LC50: 0.015 mg/l
Exposure time: 96 h
The value mentioned relates to the active ingredient trifloxystrobin.

Toxicity to aquatic plants

Pseudokirchneriella subcapitata
IC50: 2.01 mg/l
Exposure time: 120 h
The value mentioned relates to the active ingredient triadimefon.

Desmodemus subspicatus
Growth rate
IC50: 0.0053 mg/l
Exposure time: 72 h
The value mentioned relates to the active ingredient trifloxystrobin.

Acute Toxicity to Aquatic Invertebrates

Water flea (*Daphnia magna*)
EC50: 7.16 mg/l
Exposure time: 48 h
The value mentioned relates to the active ingredient triadimefon.

Water flea (*Daphnia magna*)
EC50: 0.016 mg/l



Material Safety Data Sheet

ARMADA® 50WP FUNGICIDE

MSDS Number: 102000011765
MSDS Version 2.0

Exposure time: 48 h
The value mentioned relates to the active ingredient trifloxystrobin.

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 Improper disposal of excess pesticide, spray mixture, 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 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)**



Material Safety Data Sheet

MSDS Number: 102000011765
MSDS Version 2.0

ARMADA® 50WP FUNGICIDE

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 requirements.

Freight Classification: INSECTICIDES OR FUNGICIDES, N.O.I., OTHER THAN POISON

SECTION 15. REGULATORY INFORMATION

EPA Registration No. 432-1412

US Federal Regulations

TSCA list

Quartz (Silica, Crystalline)	14808-60-7
Sodium lignosulphonate	8061-51-6
Sodium dodecylbenzenesulfonate	25155-30-0

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%
-------------	------------	------

US States Regulatory Reporting

CA Prop65

This product contains a chemical known to the State of California to cause cancer.
Crystalline quartz (respirable)

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.
-------------	------------	--------------------------

US State Right-To-Know Ingredients

Triadimefon	43121-43-3	NJ
Quartz (Silica, Crystalline)	14808-60-7	IL, MA
Sodium dodecylbenzenesulfonate	25155-30-0	CA, CT, IL, PA

Canadian Regulations

Canadian Domestic Substance List

Quartz (Silica, Crystalline)	14808-60-7
Sodium lignosulphonate	8061-51-6
Sodium dodecylbenzenesulfonate	25155-30-0

Environmental

CERCLA

Sodium dodecylbenzenesulfonate	25155-30-0	1,000 lbs
--------------------------------	------------	-----------

Clean Water Section 307 Priority Pollutants

None.

Safe Drinking Water Act Maximum Contaminant Levels

None.



Material Safety Data Sheet

ARMADA® 50WP FUNGICIDE

MSDS Number: 102000011765
MSDS Version 2.0

International Regulations

European Inventory of Existing Commercial Substances (EINECS)

Triadimefon	43121-43-3
Quartz (Silica, Crystalline)	14808-60-7

SECTION 16. OTHER INFORMATION

NFPA 704 (National Fire Protection Association):

Health - 2 Flammability - 1 Instability - 1 Others - none

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: Reviewed and updated for general editorial purposes. The following sections have been revised: Section 3: Composition / Information on Ingredients. Section 8: Exposure Controls / Personal Protection. Section 14: Transport Information.

Revision Date: 06/17/2011

This information is provided in good faith but without express or implied warranty. The customer assumes all responsibility for safety and use not in accordance with label instructions. The product names are registered trademarks of Bayer.