



ARMADA® 50WP FUNGICIDE

Version 3 / USA
102000011765

1/13
Revision Date: 01/06/2014
Print Date: 02/09/2015

SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

Product identifier

Trade name	ARMADA® 50WP FUNGICIDE
Product code (UVP)	06375049
SDS Number	102000011765
EPA Registration No.	432-1412

Relevant identified uses of the substance or mixture and uses advised against

Use	Fungicide
Restrictions on use	See product label for restrictions.

Information on manufacturer

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

Emergency telephone no.

All Emergencies, 24hr / 7 days 1-800-334-7577 (24 hours/day)

Product Information Telephone No.	1-800-331-2867
-----------------------------------	----------------

SDS Information or Request SDSINFO.BCS-NA@bayer.com

SECTION 2: HAZARDS IDENTIFICATION

Classification in accordance with regulation HCS 29CFR §1910.1200

Skin sensitisation : Category 1B
Skin irritation : Category 2
Eye irritation : Category 2B
Acute toxicity (Inhalation): Category 3
Acute toxicity (Oral): Category 4



Signal word: Danger

Hazard statements

- May cause an allergic skin reaction.
- Causes skin irritation.
- Causes eye irritation.
- Toxic if inhaled.
- Harmful if swallowed.

Precautionary statements



ARMADA® 50WP FUNGICIDE

Version 3 / USA
102000011765

2/13
Revision Date: 01/06/2014
Print Date: 02/09/2015

Avoid breathing dust, mist, spray.
Contaminated work clothing should not be allowed out of the workplace.
Wear protective gloves.
Wash thoroughly after handling.
Use only outdoors or in a well-ventilated area.
Do not eat, drink or smoke when using this product.
IF ON SKIN: Wash with plenty of soap and water.
If skin irritation or rash occurs: Get medical advice/attention.
Take off contaminated clothing and wash before reuse.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
If eye irritation persists: Get medical advice/attention.
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
Call a POISON CENTER or doctor/physician.
IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.
Rinse mouth.
Store in a well-ventilated place. Keep container tightly closed.
Store locked up.
Dispose of contents/container in accordance with local regulation.

Other hazards

No other hazards known.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

Hazardous Component Name	CAS-No.	Average % by Weight
Triadimefon	43121-43-3	41.67
Trifloxystrobin	141517-21-7	8.33
Crystalline quartz (respirable)	14808-60-7	0.38
Sodium lignosulphonate	8061-51-6	6.67
Sodium dodecylbenzenesulfonate	25155-30-0	1.53

SECTION 4: FIRST AID MEASURES

Description of first aid measures

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



ARMADA® 50WP FUNGICIDE

Version 3 / USA
102000011765

3/13
Revision Date: 01/06/2014
Print Date: 02/09/2015

Eye contact	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.
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.
Most important symptoms and effects, both acute and delayed	
Symptoms	To date no symptoms are known.
Indication of any immediate medical attention and special treatment needed	
Treatment	Appropriate supportive and symptomatic treatment as indicated by the patient's condition is recommended. There is no specific antidote.

SECTION 5: FIREFIGHTING MEASURES

Extinguishing media	
Suitable	Carbon dioxide (CO ₂), Dry chemical, Foam
Unsuitable	None known.
Special hazards arising from the substance or mixture	Dangerous gases are evolved in the event of a fire.
Advice for firefighters	
Special protective equipment for fire-fighters	Firefighters should wear NIOSH approved self-contained breathing apparatus and full protective clothing.
Further information	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.
Flash point	not applicable
Autoignition temperature	no data available
Lower explosion limit	not applicable
Upper explosion limit	not applicable
Explosivity	no data available



ARMADA® 50WP FUNGICIDE

Version 3 / USA
102000011765

4/13
Revision Date: 01/06/2014
Print Date: 02/09/2015

SECTION 6: ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

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

Methods and materials for containment and cleaning up

Methods for cleaning up Avoid dust formation. Sweep up or vacuum up spillage and collect in suitable container for disposal. Clean contaminated floors and objects thoroughly, observing environmental regulations.

Additional advice Use personal protective equipment. Do not allow to enter soil, waterways or waste water canal. Do not allow product to contact non-target plants.

SECTION 7: HANDLING AND STORAGE

Precautions for safe handling

Advice on safe handling 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.

Advice on protection against fire and explosion Keep away from heat and sources of ignition.

Hygiene measures 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.

Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers 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.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Components	CAS-No.	Control parameters	Update	Basis
Triadimefon	43121-43-3	0.7 mg/m ³ (TWA)		OES BCS*



ARMADA® 50WP FUNGICIDE

Version 3 / USA
102000011765

5/13
Revision Date: 01/06/2014
Print Date: 02/09/2015

Triadimefon	43121-43-3	100 ug/m3 (ST ESL)	07 2011	TX ESL
Triadimefon	43121-43-3	10 ug/m3 (AN ESL)	07 2011	TX ESL
Trifloxystrobin	141517-21-7	2.7 mg/m3 (TWA)		OES BCS*
Crystalline quartz (respirable) (Respirable fraction.)	14808-60-7	0.025 mg/m3 (TWA)	02 2012	ACGIH
Crystalline quartz (respirable) (Respirable dust.)	14808-60-7	0.05 mg/m3 (REL)	2010	NIOSH
Crystalline quartz (respirable) (Respirable dust.)	14808-60-7	0.1 mg/m3 (TWA)	1989	OSHA Z1A
Crystalline quartz (respirable) (Respirable dust.)	14808-60-7	0.1 mg/m3 (TWA)	06 2008	TN OEL
Crystalline quartz (respirable) (Particulate.)	14808-60-7	0.27 ug/m3 (AN ESL)	02 2013	TX ESL
Crystalline quartz (respirable) (Particulate.)	14808-60-7	14 ug/m3 (ST ESL)	02 2013	TX ESL
Crystalline quartz (respirable) (Total dust.)	14808-60-7	0.3 mg/m3 (TWA PEL)	08 2010	US CA OEL
Crystalline quartz (respirable) (Respirable dust.)	14808-60-7	0.1 mg/m3 (TWA PEL)	08 2010	US CA OEL
Crystalline quartz (respirable) (Respirable.)	14808-60-7	2.4 millions of particles per cubic foot of air (TWA)	2000	Z3
Crystalline quartz (respirable) (Respirable.)	14808-60-7	0.1 mg/m3 (TWA)	2000	Z3
Crystalline quartz (respirable) (Total dust.)	14808-60-7	0.3 mg/m3 (TWA)	2000	Z3
Kaolin (Respirable fraction.)	1332-58-7	2 mg/m3 (TWA)	02 2012	ACGIH
Kaolin (Respirable.)	1332-58-7	5 mg/m3 (REL)	2010	NIOSH
Kaolin (Total)	1332-58-7	10 mg/m3 (REL)	2010	NIOSH
Kaolin (Respirable fraction.)	1332-58-7	5 mg/m3 (TWA)	06 2008	TN OEL
Kaolin (Total dust.)	1332-58-7	10 mg/m3 (TWA)	06 2008	TN OEL
Kaolin (Particulate.)	1332-58-7	20 ug/m3 (ST ESL)	02 2013	TX ESL
Kaolin (Particulate.)	1332-58-7	2 ug/m3 (AN ESL)	02 2013	TX ESL
Kaolin (Respirable dust.)	1332-58-7	2 mg/m3 (TWA PEL)	08 2010	US CA OEL
Sodium dodecylbenzenesulfonate (Particulate.)	25155-30-0	50 ug/m3 (ST ESL)	02 2013	TX ESL



ARMADA® 50WP FUNGICIDE

Version 3 / USA
102000011765

6/13
Revision Date: 01/06/2014
Print Date: 02/09/2015

Sodium dodecylbenzenesulfonate (Vapor.)	25155-30-0	1000 ug/m3 (ST ESL)	02 2013	TX ESL
Sodium dodecylbenzenesulfonate (Vapor.)	25155-30-0	100 ug/m3 (AN ESL)	02 2013	TX ESL
Sodium dodecylbenzenesulfonate (Particulate.)	25155-30-0	5 ug/m3 (AN ESL)	02 2013	TX ESL

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

Exposure controls

Personal protective equipment

In normal use and handling conditions please refer to the label and/or leaflet. In all other cases the following recommendations would apply.

- 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.
- Hand protection** Chemical resistant nitrile rubber gloves
- Eye protection** Chemical resistant goggles must be worn.
- Skin and body protection** Wear long-sleeved shirt and long pants and shoes plus socks.
- General protective measures** 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.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

- Appearance** white to grey
- Physical State** powder
- Odor** characteristic
- Odour Threshold** no data available
- pH** 7.5 - 9.0 at 25 °C
(as aqueous solution)
- Vapor Pressure** not applicable



ARMADA® 50WP FUNGICIDE

Version 3 / USA
102000011765

7/13
Revision Date: 01/06/2014
Print Date: 02/09/2015

Vapor Density (Air = 1)	not applicable
Bulk density	233 kg/m ³
Evaporation rate	not applicable
Boiling Point	not applicable
Melting / Freezing Point	not applicable
Water solubility	dispersible
Minimum Ignition Energy	no data available
Decomposition temperature	no data available
Partition coefficient: n-octanol/water	no data available
Viscosity	not applicable
Flash point	not applicable
Autoignition temperature	no data available
Lower explosion limit	not applicable
Upper explosion limit	not applicable
Explosivity	no data available

SECTION 10: STABILITY AND REACTIVITY

Reactivity

Thermal decomposition no data available

Chemical stability Stable under normal conditions.

Possibility of hazardous reactions No hazardous reactions when stored and handled according to prescribed instructions.

Conditions to avoid Heat, flames and sparks.
Exposure to moisture.
freezing



ARMADA® 50WP FUNGICIDE

Version 3 / USA
102000011765

8/13
Revision Date: 01/06/2014
Print Date: 02/09/2015

Incompatible materials Strong oxidizing agents, Acids

Hazardous decomposition products Hydrogen chloride (HCl)
Amines
Nitrogen oxides (NO_x)
Carbon monoxide

SECTION 11: TOXICOLOGICAL INFORMATION

Exposure routes Eye contact, Skin contact, Inhalation, Ingestion

Immediate Effects

Eye Moderate eye irritation.

Skin Prolonged or frequently repeated skin contact may cause allergic reactions in some individuals. Harmful if absorbed through skin.

Ingestion Harmful if swallowed.

Inhalation Harmful if inhaled.

Information on toxicological effects

Acute oral toxicity LD₅₀ (rat) > 500 - 5,000 mg/kg

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

LC₅₀ (rat) > 2.0 - 8.0 mg/l
Exposure time: 1 h
Determined in the form of dust.
Extrapolated from the 4 hr LC₅₀.

Acute dermal toxicity LD₅₀ (rat) > 2,000 - 5,000 mg/kg

Skin irritation Moderate skin irritation. (rabbit)

Eye irritation Mild eye irritation. (rabbit)

Sensitisation (guinea pig)
May cause sensitisation by skin contact.

Assessment repeated dose toxicity

Triadimefon did not cause specific target organ toxicity in experimental animal studies.
Trifloxystrobin did not cause specific target organ toxicity in experimental animal studies.

Assessment Mutagenicity

Triadimefon was not mutagenic or genotoxic in a battery of in vitro and in vivo tests.
Trifloxystrobin was not mutagenic or genotoxic in a battery of in vitro and in vivo tests.



ARMADA® 50WP FUNGICIDE

Version 3 / USA
102000011765

9/13
Revision Date: 01/06/2014
Print Date: 02/09/2015

Assessment Carcinogenicity

Triadimefon was not carcinogenic in a lifetime feeding study in rats. Triadimefon caused an increased incidence of tumours in mice in the following organ(s): liver. The mechanism that triggers these tumours is not relevant to humans.

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

ACGIH

Crystalline quartz (respirable)	14808-60-7	Group A2
---------------------------------	------------	----------

NTP

Crystalline quartz (respirable)	14808-60-7
---------------------------------	------------

IARC

Crystalline quartz (respirable)	14808-60-7	Overall evaluation: 1
---------------------------------	------------	-----------------------

OSHA

None.

Assessment toxicity to reproduction

Triadimefon caused reproduction toxicity in a two-generation study in rats only at dose levels also toxic to the parent animals. Triadimefon caused reduced fertility, a reduced pup survival.

Trifloxystrobin caused reproduction toxicity in a two-generation study in rats only at dose levels also toxic to the parent animals. The reproduction toxicity seen with Trifloxystrobin is related to parental toxicity.

Assessment developmental toxicity

Triadimefon caused developmental toxicity in only at dose levels toxic to the dams. Triadimefon caused an increased incidence of non-specific malformations.

Trifloxystrobin caused developmental toxicity only at dose levels toxic to the dams. The developmental effects seen with Trifloxystrobin are related to maternal toxicity.

Further information

Acute toxicity studies have not been performed on this product as formulated.

Acute toxicity studies have been bridged from a similar formulation(s).

The non-acute information pertains to the active ingredient(s).

SECTION 12: ECOLOGICAL INFORMATION

Toxicity to fish

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

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



ARMADA® 50WP FUNGICIDE

Version 3 / USA
102000011765

10/13
Revision Date: 01/06/2014
Print Date: 02/09/2015

Toxicity to aquatic invertebrates	EC50 (Water flea (Daphnia magna)) 7.16 mg/l Exposure time: 48 h The value mentioned relates to the active ingredient triadimefon. EC50 (Water flea (Daphnia magna)) 0.016 mg/l Exposure time: 48 h The value mentioned relates to the active ingredient trifloxystrobin.
Toxicity to aquatic plants	IC50 (Pseudokirchneriella subcapitata) 2.01 mg/l Exposure time: 120 h The value mentioned relates to the active ingredient triadimefon. IC50 (Desmodemus subspicatus) 0.0053 mg/l Growth rate; Exposure time: 72 h The value mentioned relates to the active ingredient trifloxystrobin.
Biodegradability	Triadimefon: not rapidly biodegradable Trifloxystrobin: not rapidly biodegradable
Koc	Triadimefon: Koc:150 - 510 Trifloxystrobin: Koc:2377
Bioaccumulation	Triadimefon: Bioconcentration factor (BCF) 31 Does not bioaccumulate. Trifloxystrobin: Bioconcentration factor (BCF) 431 Does not bioaccumulate.
Mobility in soil	Triadimefon: Moderately mobile in soils Trifloxystrobin: Slightly mobile in soils
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. Drift and runoff from treated areas may be hazardous to aquatic organisms in adjacent sites. Do not contaminate surface or ground water by cleaning equipment or disposal of wastes, including equipment wash water. Apply this product as specified on the label.

SECTION 13: DISPOSAL CONSIDERATIONS

Waste treatment methods

Product 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



ARMADA® 50WP FUNGICIDE

Version 3 / USA
102000011765

11/13
Revision Date: 01/06/2014
Print Date: 02/09/2015

Agency, or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.

Contaminated packaging	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
Proper shipping name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (TRIFLOXYSTROBIN, TRIADIMEFON MIXTURE)
IATA	
UN number	3077
Class	9
Packaging group	III
Environm. Hazardous Mark	YES
Proper shipping name	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 requirements.

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

SECTION 15: REGULATORY INFORMATION

EPA Registration No. 432-1412



ARMADA® 50WP FUNGICIDE

Version 3 / USA
102000011765

12/13
Revision Date: 01/06/2014
Print Date: 02/09/2015

US Federal Regulations

TSCA list

Crystalline quartz (respirable) 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 25,000lbs

US States Regulatory Reporting

CA Prop65

This product contains a chemical known to the State of California to cause cancer.

Crystalline quartz (respirable) 14808-60-7

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

Triadimefon 43121-43-3 Developmental toxin.
Triadimefon 43121-43-3 Male reproductive toxin.
Triadimefon 43121-43-3 Female reproductive toxin.

US State Right-To-Know Ingredients

Triadimefon 43121-43-3 NJ
Crystalline quartz (respirable) 14808-60-7 MN
Sodium dodecylbenzenesulfonate 25155-30-0 CA, CT

Canadian Regulations

Canadian Domestic Substance List

Crystalline quartz (respirable) 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.

International Regulations

European Inventory of Existing Commercial Substances (EINECS)

Triadimefon 43121-43-3
Crystalline quartz (respirable) 14808-60-7
Sodium dodecylbenzenesulfonate 25155-30-0

EPA/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 required on the pesticide label:



ARMADA® 50WP FUNGICIDE

Version 3 / USA
102000011765

13/13
Revision Date: 01/06/2014
Print Date: 02/09/2015

Signal word: Caution!

Hazard statements: 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.

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: Revised according to the current OSHA Hazard Communication Standard (29CFR1910.1200)

Revision Date: 01/06/2014

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.