

## SAFETY PRECAUTIONS

### Operator protection:

Engineering control of operator exposure must be used where reasonably practicable in addition to the following personal protective equipment:

WEAR SUITABLE PROTECTIVE CLOTHING (COVERALLS) AND SUITABLE PROTECTIVE GLOVES when handling the concentrate.

However, engineering controls may replace personal protective equipment if a COSHH assessment shows they provide an equal or higher standard of protection.

WASH ALL PROTECTIVE CLOTHING after use.

WHEN USING DO NOT EAT, DRINK OR SMOKE.

### Environmental protection:

DO NOT CONTAMINATE WATER with the product or its container. Do not clean application equipment near surface water. Avoid contamination via drains from farmyards and roads.

To protect aquatic organisms respect an unsprayed buffer zone to surface water bodies in line with the LERAP requirement. (LERAP Scheme not applicable in the Republic of Ireland).

DO NOT ALLOW DIRECT SPRAY from horizontal boom sprayers to fall within 5 metres of the top of the bank of a static or flowing water body, unless a Local Environmental Risk Assessment for Pesticides (LERAP) permits a narrower buffer zone, or within 1 metre of the top of a ditch which is dry at the time of application.

REPUBLIC OF IRELAND: To protect aquatic organisms respect an unsprayed buffer zone of 5 m to surface water bodies.

DO NOT ALLOW DIRECT SPRAY from hand-held sprayers to fall within 1 metre of the top of the bank of a static or flowing water body. Aim spray away from water.

This product qualifies for inclusion within the Local Environmental Risk Assessment for Pesticides (LERAP) scheme. Before each spraying operation from a horizontal boom sprayer, either a LERAP must be

carried out in accordance with HSE's published guidance or the statutory buffer zone must be maintained. The results of the LERAP must be recorded and kept available for three years. (LERAP Scheme not applicable in the Republic of Ireland).

### Storage and disposal:

KEEP AWAY FROM FOOD, DRINK AND ANIMAL FEEDING STUFFS. DO NOT RE-USE CONTAINER for any purpose.

This label is compliant with the CPA Voluntary Initiative Guidance. (UK only)



Dow AgroSciences

# Fortress<sup>®</sup>

## FUNGICIDE

Product Registration Number: MAPP 08279/PCS No. 02364

A suspension concentrate containing 500 g/litre (41.32% w/w) quinoxifen.

A systemic fungicide for protection against POWDERY MILDEW on WINTER WHEAT, WINTER BARLEY, SPRING WHEAT, SPRING BARLEY, WINTER OATS, SPRING OATS, RYE, TRITICALE, DURUM WHEAT and SUGAR BEET.

The (COSHH) Control of Substances Hazardous to Health Regulations may apply to the use of this product at work (UK only).

Triple Rinse Containers, Puncture and Invert to Dry at time of Use

READ DIRECTIONS FOR USE ON ATTACHED LEAFLET.

PROFESSIONAL USE ONLY

# 1 Litre e



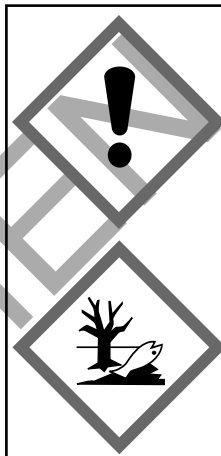
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### Dow AgroSciences Limited

CPC2 Capital Park, Fulbourn, Cambridge, CB21 5XE.

Telephone: +44(0)1462 457272 Fax: +44(0)1462 426605

24 hour Emergency Telephone Number: +44 (0) 1553 761 251



Product Identifier according to Art. 18 of Reg. (EC)  
No 1272/2008 [CLP]: Fortress<sup>®</sup>; Quinoxifen

## WARNING

May cause an allergic skin reaction.

Very toxic to aquatic life with long lasting effects.

Wear protective gloves/protective clothing.

If skin irritation or rash occurs: Get medical advice/attention.

Collect spillage.

Dispose of contents/container to a licensed waste disposal contractor or collection site except for empty clean triple rinsed containers which can be disposed of as non-hazardous waste.

To avoid risks to human health and the environment, comply with the instructions for use.

MAPP 08279 / PCS No. 02364

## IMPORTANT INFORMATION

FOR USE ONLY AS AN AGRICULTURAL FUNGICIDE

Crops	Maximum Individual Dose	Maximum Total Dose	Latest Time of Application
Wheat, barley, oats, rye and triticale	0.3 litre product per hectare	0.6 litre product per hectare per crop	Before first spikelet of inflorescence visible (GS49)
Sugar beet	0.3 litre product per hectare	0.4 litre product per hectare per crop	28 days before harvest

Read the label before use. Using this product in a manner that is inconsistent with the label may be an offence. Follow the Code of Practice for Using Plant Protection Products.

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## DIRECTIONS FOR USE

IMPORTANT: This information is approved as part of the Product Label. All instructions within this section must be read carefully in order to obtain safe and successful use of this product.

### NOTES

Do not spray in windy weather and avoid drift on to non-target crops/areas. FORTRESS® used alone is rainfast one hour after application.

Wash equipment thoroughly after use.

Under conditions of severe drought stress, the systemic effect of FORTRESS may be reduced.

### RESISTANCE

FORTRESS contains a quinoline group fungicide and must be considered to be in the same mode of action group for resistance management purposes as quinazolinones.

Strains of wheat powdery mildew insensitive to quinoxifen have been isolated, there is a risk that these may reduce the effectiveness of FORTRESS. To prevent the development and spread of these strains it is important that the following guidelines are followed:

- Use FORTRESS in alternation or in mixture with fungicides of a different mode of action effective against powdery mildew.
- Always apply in mixture with a curative fungicide where disease is established.
- Do not apply more than two applications to the same crop.
- Do not apply in the autumn.

### PROBLEM CONTROLLED

FORTRESS is a systemic protectant fungicide giving protection against powdery mildew infection on new plant growth. FORTRESS has no curative properties and will not control latent infections of powdery mildew. (Latency is the period between infection having taken place and the development of visible symptoms).

### CROPS

#### CEREALS

FORTRESS may be used on all varieties of winter and spring sown wheat, barley, oats, rye, triticale and durum wheat.

#### SUGAR BEET

FORTRESS may be used on all varieties of sugar beet.

### RATES OF USE

#### CEREALS

Winter wheat, spring wheat, winter barley, spring barley, winter oats, spring oats, rye, triticale and durum wheat

Maximum individual dose: 0.3 litre/ha

Maximum total dose per crop: 0.6 litre/ha

#### Winter wheat - Split dose treatment

As an alternative to the 0.3 litre/ha rate, a sequence of two applications of FORTRESS at 0.15 litre/ha can be made to winter wheat crops.

#### SUGAR BEET

Maximum individual dose: 0.3 litre/ha

Maximum total dose per crop: 0.4 litre/ha

#### Sugar beet - Split dose treatment

As an alternative to the 0.3 litre/ha rate, a sequence of two applications of FORTRESS at 0.2 litre/ha can be made to sugar beet crops. The sequence approach may be beneficial where high and sustained levels of powdery mildew are expected, where re-infestation of powdery mildew is expected, or where a later harvest is planned.

### TIME OF APPLICATION

For best results, FORTRESS should be applied at an early stage of disease development, before infection spreads to new crop growth. This is particularly important if weather conditions and/or crop varieties are favourable for disease development. FORTRESS has no curative properties and will not therefore control latent or established infections of powdery mildew present at application. If infection is established, a curative fungicide should be tank mixed with FORTRESS (see Compatibility section). For broad spectrum disease control, FORTRESS should be used in tank mix with a broad spectrum fungicide (see Compatibility section). If the disease pressure remains high, a further application of FORTRESS may be necessary.

#### CEREALS

FORTRESS should be applied in the spring only, at the first sign of disease.

Applications can be made to cereal crops from the mid-tillering stage of crop growth (Zadoks 25) up to Zadoks 49. If a split application is made to winter wheat crops, the first application should be made at the first signs of disease (approximately Zadoks 30-31), with a second application 4 weeks later at approximately Zadoks 37-39.

#### SUGAR BEET

FORTRESS should be applied at the first sign of disease which is usually late July or early August. If applying FORTRESS in a sequence, a further application can be made to sugar beet crops any time up to 28 days before harvest.

### MIXING

Half fill the sprayer tank with clean water and commence agitation. Add the appropriate amount of FORTRESS and add the remainder of the water. The spray mix must be agitated continuously during mixing and until application is complete. Empty containers should be rinsed thoroughly, and the rinsings added to the spray tank.

### WATER VOLUME

#### CEREALS AND SUGAR BEET

The recommended spray volume is 200 to 400 litres of water per hectare. The lowest water volume should only be used on very open crops. Use the higher water volume where the crop is dense. The recommended spray pressure is 2.0 to 3.0 bars.

### SPRAY QUALITY

Apply FORTRESS as a MEDIUM spray, as defined by the BCPC system, using a conventional hydraulic sprayer

### COMPATIBILITY

For the latest advice on tank mixes please contact Dow AgroSciences.

### Dow AgroSciences Conditions of Supply

All goods supplied by us are of high grade and we believe them to be suitable but, as we cannot exercise control over their storage, handling, mixing or use, or the weather conditions before, during or after application, which may affect the performance of the goods, all conditions and warranties, statutory or otherwise, as to the quality or fitness for any purpose of our goods are excluded. No responsibility will be accepted by us, or re-sellers for any failure in performance, damage or injury whatsoever, arising from their storage, handling, application or use. These conditions cannot be varied by our staff or agents whether or not they supervise or assist in the use of such goods.

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# Safety Data Sheet

This Safety Data Sheet does not form part of the approved product label.

## SECTION 1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

### 1.1 Product identifier

**Product name:** FORTRESS™ Fungicide

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

**Identified uses:** Plant Protection Product

### 1.3 Details of the supplier of the safety data sheet

#### COMPANY IDENTIFICATION

DOW AGROSCIENCES LIMITED  
LATCHMORE COURT  
BRAND STREET  
HITCHIN  
England  
SG5 1NH  
UNITED KINGDOM

#### Customer Information Number:

SDSQuestion@dow.com

### 1.4 EMERGENCY TELEPHONE NUMBER

**24-Hour Emergency Contact:** 0031 115 694 982

**Local Emergency Contact:** 00 31 115 69 4982

## SECTION 2. HAZARDS IDENTIFICATION

### 2.1 Classification of the substance or mixture

#### Classification according to Regulation (EC) No 1272/2008:

Skin sensitisation - Category 1 - H317

Acute aquatic toxicity - Category 1 - H400

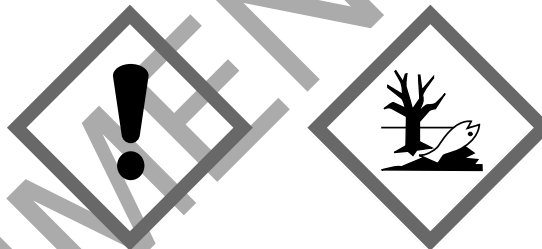
Chronic aquatic toxicity - Category 1 - H410

For the full text of the H-Statements mentioned in this Section, see Section 16.

### 2.2 Label elements

**Labelling according to Regulation (EC) No 1272/2008:**

#### Hazard pictograms



**Signal word:** WARNING

#### Hazard statements

H317 May cause an allergic skin reaction.

H410 Very toxic to aquatic life with long lasting effects.

#### Precautionary statements

P280 Wear protective gloves/ protective clothing.

P333 + P313 If skin irritation or rash occurs: Get medical advice/ attention.

P391 Collect spillage.

P501 Dispose of contents/container to a licensed hazardous-waste disposal contractor or collection site except for empty clean containers which can be disposed of as non-hazardous waste.

#### Supplemental information

EUH401 To avoid risks to human health and the environment, comply with the instructions for use.

**Contains** quinoxyfen

### 2.3 Other hazards

No data available

## SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

### 3.2 Mixtures

This product is a mixture.

CASRN / EC-No. / Index-No.	REACH Registration Number	Concentration	Component	Classification: REGULATION (EC) No 1272/2008
CASRN 124495-18-7 EC-No. Not available Index-No. 613-138-00-7	-	41.3%	quinoxifen	Skin Sens. - 1 - H317 Aquatic Acute - 1 - H400 Aquatic Chronic - 1 - H410
CASRN 57-55-6 EC-No. 200-338-0 Index-No. -	01-2119456809-23	< 5.0 %	Propylene glycol	Not classified
CASRN 68425-94-5 EC-No. Not available Index-No. -	-	< 5.0 %	Petroleum Residues, Catalytic Reformer Fractionator, Sulfonated, Polymers with Formaldehyde, Sodium Salts	Skin Irrit. - 2 - H315 Eye Irrit. - 2 - H319

If present in this product, any not classified components disclosed above for which no country specific OEL value(s) is(are) indicated under Section 8, are being disclosed as voluntarily disclosed components. For the full text of the H-Statements mentioned in this Section, see Section 16.

## SECTION 4. FIRST AID MEASURES

### 4.1 Description of first aid measures

**General advice:** First Aid responders should pay attention to self-protection and use the recommended protective clothing (chemical resistant gloves, splash protection). If potential for exposure exists refer to Section 8 for specific personal protective equipment.

**Inhalation:** Move person to fresh air. If person is not breathing, call an emergency responder or ambulance, then give artificial respiration; if by mouth to mouth use rescuer protection (pocket mask etc). Call a poison control center or doctor for treatment advice.

**Skin contact:** Take off contaminated clothing. Wash skin with soap and plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice. Wash clothing before reuse. Shoes and other leather items which cannot be decontaminated should be disposed of properly.

**Eye contact:** 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 eyes. Call a poison control center or doctor for treatment advice.

**Ingestion:** No emergency medical treatment necessary.

**4.2 Most important symptoms and effects, both acute and delayed:** Aside from the information found under Description of first aid measures (above) and Indication of immediate medical attention and special treatment needed (below), any additional important symptoms and effects are described in Section 11: Toxicology Information.

### 4.3 Indication of any immediate medical attention and special treatment needed

**Notes to physician:** No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient. Have the Safety Data Sheet, and if available, the product container or label with you when calling a poison control center or doctor, or going for treatment.

## SECTION 5. FIREFIGHTING MEASURES

### 5.1 Extinguishing media

**Suitable extinguishing media:** To extinguish combustible residues of this product use water fog, carbon dioxide, dry chemical or foam.

**Unsuitable extinguishing media:** No data available

### 5.2 Special hazards arising from the substance or mixture

**Hazardous combustion products:** Under fire conditions some components of this product may decompose. The smoke may contain unidentified toxic and/or irritating compounds. Combustion products may include and are not limited to: Nitrogen oxides. Hydrogen fluoride. Hydrogen chloride. Carbon monoxide. Carbon dioxide.

**Unusual Fire and Explosion Hazards:** This material will not burn until the water has evaporated. Residue can burn.

### 5.3 Advice for firefighters

**Fire Fighting Procedures:** Keep people away. Isolate fire and deny unnecessary entry. Use water spray to cool fire exposed containers and fire affected zone until fire is out and danger of reignition has passed. To extinguish combustible residues of this product use water fog, carbon dioxide, dry chemical or foam. Contain fire water run-off if possible. Fire water run-off, if not contained, may cause environmental damage. Review the "Accidental Release Measures" and the "Ecological Information" sections of this (M)SDS.

**Special protective equipment for firefighters:** Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots, and gloves). If protective equipment is not available or not used, fight fire from a protected location or safe distance.

## SECTION 6. ACCIDENTAL RELEASE MEASURES

**6.1 Personal precautions, protective equipment and emergency procedures:** Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.

**6.2 Environmental precautions:** Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information. Spills or discharge to natural waterways is likely to kill aquatic organisms.

**6.3 Methods and materials for containment and cleaning up:** Contain spilled material if possible. Small spills: Absorb with materials such as: Clay. Dirt. Sand. Sweep up. Collect in suitable and properly labeled containers. Large spills: Contact Dow AgroSciences for clean-up assistance. See Section 13, Disposal Considerations, for additional information.

**6.4 Reference to other sections:** References to other sections, if applicable, have been provided in the previous sub-sections.

## SECTION 7. HANDLING AND STORAGE

**7.1 Precautions for safe handling:** Keep out of reach of children. Do not swallow. Avoid contact with eyes, skin, and clothing. Avoid breathing vapor or mist. Wash thoroughly after handling. Use with adequate ventilation. Spills of these organic materials on hot fibrous insulations may lead to lowering of the autoignition temperatures possibly resulting in spontaneous combustion. See Section 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION.

**7.2 Conditions for safe storage, including any incompatibilities:** Store in a dry place. Store in original container. Keep container tightly closed when not in use. Do not store near food, foodstuffs, drugs or potable water supplies.

**7.3 Specific end use(s):** Refer to product label.

## SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

### 8.1 Control parameters

Exposure limits are listed below, if they exist.

Component	Regulation	Type of listing	Value/Notation
quinoxifen	Dow IHG	TWA	5 mg/m3
	Dow IHG	TWA	Skin Sensitizer
Propylene glycol	US WEEL	TWA	10 mg/m3
	GB EH40	TWA	474 mg/m3 150 ppm
	GB EH40	TWA	10 mg/m3
	GB EH40	TWA particles	10 mg/m3
	GB EH40	TWA Total vapour and particles	474 mg/m3 150 ppm

RECOMMENDATIONS IN THIS SECTION ARE FOR MANUFACTURING, COMMERCIAL BLENDING AND PACKAGING WORKERS. APPLICATORS AND HANDLERS SHOULD SEE THE PRODUCT LABEL FOR PROPER PERSONAL PROTECTIVE EQUIPMENT AND CLOTHING.

### 8.2 Exposure controls

**Engineering controls:** Use local exhaust ventilation, or other engineering controls to maintain airborne levels below exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, general ventilation should be sufficient for most operations. Local exhaust ventilation may be necessary for some operations.

#### Individual protection measures

**Eye/face protection:** Use safety glasses (with side shields). Safety glasses (with side shields) should be consistent with EN 166 or equivalent.

#### Skin protection

**Hand protection:** Use chemical resistant gloves classified under Standard EN374: Protective gloves against chemicals and micro-organisms. Examples of preferred glove barrier materials include: Polyethylene. Ethyl vinyl alcohol laminate ("EVAL"). Examples of acceptable glove barrier materials include: Butyl rubber. Natural rubber ("latex"). Neoprene. Nitrile/butadiene rubber ("nitrile" or "NBR"). Polyvinyl chloride ("PVC" or "vinyl"). Viton. When prolonged or frequently repeated contact may occur, a glove with a protection class of 5 or higher (breakthrough time greater than 240 minutes according to EN 374) is recommended. When only brief contact is expected, a glove with a protection class of 3 or higher (breakthrough time greater than 60 minutes according to EN 374) is recommended. Glove thickness alone is not a good indicator of the level of protection a glove provides against a chemical substance as this level of protection is also highly dependent on the specific composition of the material that the glove is fabricated from. The thickness of the glove must, depending on model and type of material, generally be more than 0.35 mm to offer sufficient protection for prolonged and frequent contact with the substance. As an exception to this general rule it is known that multilayer laminate gloves may offer prolonged protection at thicknesses less than 0.35 mm. Other glove materials with a thickness of less than 0.35 mm may offer sufficient protection when only brief contact is expected. NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.

**Other protection:** Use protective clothing chemically resistant to this material. Selection of specific items such as face shield, boots, apron, or full body suit will depend on the task.

**Respiratory protection:** Respiratory protection should be worn when there is a potential to exceed the exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, wear respiratory protection when adverse effects, such as respiratory irritation or discomfort have been experienced, or where indicated by your risk assessment process. For most conditions no respiratory protection should be needed; however, if discomfort is experienced, use an approved air-purifying respirator. Use the following CE approved air-purifying respirator: Organic vapor cartridge with a particulate pre-filter, type AP2.

#### Environmental exposure controls

See SECTION 7: Handling and storage and SECTION 13: Disposal considerations for measures to prevent excessive environmental exposure during use and waste disposal.

## SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

### 9.1 Information on basic physical and chemical properties

#### Appearance

Physical state	Liquid.
Color	Tan
Odor	No test data available
Odor Threshold	No test data available
pH	7.15 1% pH Electrode
Melting point/range	Not applicable
Freezing point	No test data available
Boiling point (760 mmHg)	No test data available
Flash point	closed cup PMCC, ASTM D93 flame extinguished; none to boiling
Evaporation Rate (Butyl Acetate = 1)	No test data available
Flammability (solid, gas)	Not Applicable
Lower explosion limit	No test data available
Upper explosion limit	No test data available
Vapor Pressure	No test data available
Relative Vapor Density (air = 1)	No test data available
Relative Density (water = 1)	1.204 at 24 °C / 4 °C <i>Pyknometer</i>
Water solubility	No test data available
Partition coefficient: n-octanol/water	No data available
Auto-ignition temperature	none below 400 degC
Decomposition temperature	No test data available
Dynamic Viscosity	197 mPa.s at 20 °C
Kinematic Viscosity	164 cSt at 20 °C
Explosive properties	No
Oxidizing properties	No

### 9.2 Other information

Molecular weight No data available

NOTE: The physical data presented above are typical values and should not be construed as a specification.

## SECTION 10. STABILITY AND REACTIVITY

**10.1 Reactivity:** No dangerous reaction known under conditions of normal use.

**10.2 Chemical stability:** Stable under recommended storage conditions. See Storage, Section 7.

**10.3 Possibility of hazardous reactions:** Polymerization will not occur.

**10.4 Conditions to avoid:** Some components of this product can decompose at elevated temperatures. Generation of gas during decomposition can cause pressure in closed systems.

**10.5 Incompatible materials:** Avoid contact with: Strong acids. Strong bases. Strong oxidizers.

**10.6 Hazardous decomposition products:** Decomposition products depend upon temperature, air supply and the presence of other materials. Decomposition products can include and are not limited to: Hydrogen chloride. Hydrogen fluoride. Nitrogen oxides.

## SECTION 11. TOXICOLOGICAL INFORMATION

*Toxicological information appears in this section when such data is available.*

### 11.1 Information on toxicological effects

#### Acute toxicity

##### Acute oral toxicity

Very low toxicity if swallowed. Harmful effects not anticipated from swallowing small amounts.

As product:

LD50, Rat, > 2,000 mg/kg No deaths occurred at this concentration.

##### Acute dermal toxicity

Prolonged skin contact is unlikely to result in absorption of harmful amounts.

As product:

LD50, Rat, > 2,000 mg/kg No deaths occurred at this concentration.

##### Acute inhalation toxicity

At room temperature, exposure to vapor is minimal due to low volatility. No adverse effects are anticipated from single exposure to vapor.

As product: The LC50 has not been determined.

Based on information for component(s):

LC50, Rat, 4 Hour, dust/mist, > 5 mg/l

#### Skin corrosion/irritation

Essentially nonirritating to skin.

#### Serious eye damage/eye irritation

Essentially nonirritating to eyes.

#### Sensitization

Has caused allergic skin reactions in humans.

Did not cause allergic skin reactions when tested in guinea pigs.

For respiratory sensitization:

No relevant data found.

### Specific Target Organ Systemic Toxicity (Single Exposure)

Evaluation of available data suggests that this material is not an STOT-SE toxicant.

### Specific Target Organ Systemic Toxicity (Repeated Exposure)

For the active ingredient(s):

In animals, effects have been reported on the following organs:

Kidney.

Liver.

Blood.

### Carcinogenicity

For the active ingredient(s): Did not cause cancer in laboratory animals.

### Teratogenicity

For the active ingredient(s): Did not cause birth defects or other effects in the fetus even at doses which caused toxic effects in the mother.

### Reproductive toxicity

For the active ingredient(s): In animal studies, did not interfere with reproduction.

### Mutagenicity

For the active ingredient(s): In vitro genetic toxicity studies were negative. Animal genetic toxicity studies were negative.

### Aspiration Hazard

Based on physical properties, not likely to be an aspiration hazard.

## SECTION 12. ECOLOGICAL INFORMATION

*Ecotoxicological information appears in this section when such data is available.*

### 12.1 Toxicity

#### Acute toxicity to fish

Material is very toxic to aquatic organisms (LC50/EC50/IC50 below 1 mg/L in the most sensitive species).

LC50, Rainbow trout (*Oncorhynchus mykiss*), semi-static test, 96 Hour, > 100 mg/l

#### Acute toxicity to aquatic invertebrates

EC50, water flea *Daphnia magna*, static test, 48 Hour, 0.2 mg/l

#### Acute toxicity to algae/aquatic plants

ErC50, alga *Scenedesmus* sp., static test, 72 Hour, 0.28 mg/l

#### Toxicity to soil-dwelling organisms

LC50, *Eisenia fetida* (earthworms), 14 d, > 1,000 mg/kg

### 12.2 Persistence and degradability

#### quinoxifen

**Biodegradability:** Based on stringent OECD test guidelines, this material cannot be considered as readily biodegradable; however, these results do not necessarily mean that the material is not biodegradable under environmental conditions.

10-day Window: Fail

**Biodegradation:** 2 - 3 %

**Exposure time:** 28 d

**Method:** OECD Test Guideline 301B or Equivalent

#### Stability in Water (1/2-life)

Hydrolysis, half-life, > 1 year

#### Photodegradation

**Atmospheric half-life:** 1.88 d

#### Propylene glycol

**Biodegradability:** Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).

10-day Window: Pass

**Biodegradation:** 81 %

**Exposure time:** 28 d

**Method:** OECD Test Guideline 301F or Equivalent

10-day Window: Not applicable

**Biodegradation:** 96 %

**Exposure time:** 64 d

**Method:** OECD Test Guideline 306 or Equivalent

#### Petroleum Residues, Catalytic Reformer Fractionator, Sulfonated, Polymers with Formaldehyde, Sodium Salts

**Biodegradability:** No relevant data found.

### 12.3 Bioaccumulative potential

#### quinoxifen

**Bioaccumulation:** Bioconcentration potential is high (BCF > 3000 or Log Pow between 5 and 7).

**Partition coefficient: n-octanol/water(log Pow):** 4.66 Measured

**Bioconcentration factor (BCF):** 5,040 Fish Measured

#### Propylene glycol

**Bioaccumulation:** Bioconcentration potential is low (BCF < 100 or Log Pow < 3).

**Partition coefficient: n-octanol/water(log Pow):** -1.07 Measured

**Bioconcentration factor (BCF):** 0.09 Estimated.

#### Petroleum Residues, Catalytic Reformer Fractionator, Sulfonated, Polymers with Formaldehyde, Sodium Salts

**Bioaccumulation:** No data available for this product.

## 12.4 Mobility in soil

### quinoxifen

Expected to be relatively immobile in soil (Koc > 5000).

**Partition coefficient(Koc):** 22929 Estimated.

### Propylene glycol

Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process.

Potential for mobility in soil is very high (Koc between 0 and 50).

**Partition coefficient(Koc):** < 1 Estimated.

### Petroleum Residues, Catalytic Reformer Fractionator, Sulfonated, Polymers with

#### Formaldehyde, Sodium Salts

No relevant data found.

## 12.5 Results of PBT and vPvB assessment

### quinoxifen

This substance has not been assessed for persistence, bioaccumulation and toxicity (PBT).

### Propylene glycol

This substance is not considered to be persistent, bioaccumulating and toxic (PBT). This substance is not considered to be very persistent and very bioaccumulating (vPvB).

### Petroleum Residues, Catalytic Reformer Fractionator, Sulfonated, Polymers with

#### Formaldehyde, Sodium Salts

This substance has not been assessed for persistence, bioaccumulation and toxicity (PBT).

## 12.6 Other adverse effects

### quinoxifen

This substance is not in Annex I of Regulation (EC) No 1005/2009 on substances that deplete the ozone layer.

### Propylene glycol

This substance is not in Annex I of Regulation (EC) No 1005/2009 on substances that deplete the ozone layer.

### Petroleum Residues, Catalytic Reformer Fractionator, Sulfonated, Polymers with

#### Formaldehyde, Sodium Salts

This substance is not in Annex I of Regulation (EC) No 1005/2009 on substances that deplete the ozone layer.

## SECTION 13. DISPOSAL CONSIDERATIONS

### 13.1 Waste treatment methods

If wastes and/or containers cannot be disposed of according to the product label directions, disposal of this material must be in accordance with your local or area regulatory authorities. This information presented below only applies to the material as supplied. The identification based on characteristic(s) or listing may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste

identification and disposal methods in compliance with applicable regulations. If the material as supplied becomes a waste, follow all applicable regional, national and local laws.

The definitive assignment of this material to the appropriate EWC group and thus its proper EWC code will depend on the use that is made of this material. Contact the authorized waste disposal services.

## SECTION 14. TRANSPORT INFORMATION

### Classification for ROAD and Rail transport (ADR/RID):

14.1	UN number	UN 3082
14.2	Proper shipping name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.(Quinoxifen)
14.3	Class	9
14.4	Packing group	III
14.5	Environmental hazards	Quinoxifen
14.6	Special precautions for user	Hazard Identification Number: 90

### Classification for SEA transport (IMO-IMDG):

14.1	UN number	UN 3082
14.2	Proper shipping name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.(Quinoxifen)
14.3	Class	9
14.4	Packing group	III
14.5	Environmental hazards	Quinoxifen
14.6	Special precautions for user	EmS: F-A, S-F
14.7	Transport in bulk according to Annex I or II of MARPOL 73/78 and the IBC or IGC Code	Consult IMO regulations before transporting ocean bulk

### Classification for AIR transport (IATA/ICAO):

14.1	UN number	UN 3082
14.2	Proper shipping name	Environmentally hazardous substance, liquid, n.o.s. (Quinoxifen)
14.3	Class	9
14.4	Packing group	III
14.5	Environmental hazards	Not applicable
14.6	Special precautions for user	No data available.



This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Transportation classifications may vary by container volume and may be influenced by regional or country variations in regulations. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

## SECTION 15. REGULATORY INFORMATION

### 15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

#### REACH Regulation (EC) No 1907/2006

This product contains only components that have been either pre-registered, registered, are exempt from registration, are regarded as registered or are not subject to registration according to Regulation (EC) No. 1907/2006 (REACH). The aforementioned indications of the REACH registration status are provided in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. It is the buyer's/user's responsibility to ensure that his/her understanding of the regulatory status of this product is correct.

#### Seveso III: Directive 2012/18/EU of the European Parliament and of the Council on the control of major-accident hazards involving dangerous substances.

Listed in Regulation: ENVIRONMENTAL HAZARDS

Number in Regulation: E1

100 t

200 t

#### Other regulations

Registration Number: MAFF 08279

### 15.2 Chemical Safety Assessment

For proper and safe use of this product, please refer to the approval conditions laid down on the product label.

## SECTION 16. OTHER INFORMATION

### Full text of H-Statements referred to under sections 2 and 3.

H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H319	Causes serious eye irritation.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.

### Classification and procedure to derive the classification for mixtures according to Regulation (EC) No 1272/2008

Skin Sens. - 1 - H317 - On basis of test data.

Aquatic Acute - 1 - H400 - On basis of test data.

Aquatic Chronic - 1 - H410 - Calculation method

### Revision

Identification Number: 101190619 / A293 / Issue Date: 08.02.2016 / Version: 5.1

DAS Code: EF-1186

Most recent revision(s) are noted by the bold, double bars in left-hand margin throughout this document.

### Legend

Dow IHG	Dow Industrial Hygiene Guideline
GB EH40	UK. EH40 WEL - Workplace Exposure Limits
TWA	Long-term exposure limit (8-hour TWA reference period)
US WEEL	USA. Workplace Environmental Exposure Levels (WEEL)

### Information Source and References

This SDS is prepared by Product Regulatory Services and Hazard Communications Groups from information supplied by internal references within our company.

DOW AGROSCIENCES LIMITED urges each customer or recipient of this (M)SDS to study it carefully and consult appropriate expertise, as necessary or appropriate, to become aware of and understand the data contained in this (M)SDS and any hazards associated with the product. The information herein is provided in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ between various locations. It is the buyer's/user's responsibility to ensure that his activities comply with all federal, state, provincial or local laws. The information presented here pertains only to the product as shipped. Since conditions for use of the product are not under the control of the manufacturer, it is the buyer's/user's duty to determine the conditions necessary for the safe use of this product. Due to the proliferation of sources for information such as manufacturer-specific (M)SDSs, we are not and cannot be responsible for (M)SDSs obtained from any source other than ourselves. If you have obtained an (M)SDS from another source or if you are not sure that the (M)SDS you have is current, please contact us for the most current version.

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SPECIMEN

## SAFETY PRECAUTIONS

### Operator protection:

Engineering control of operator exposure must be used where reasonably practicable in addition to the following personal protective equipment:

WEAR SUITABLE PROTECTIVE CLOTHING (COVERALLS) AND SUITABLE PROTECTIVE GLOVES when handling the concentrate.

However, engineering controls may replace personal protective equipment if a COSHH assessment shows they provide an equal or higher standard of protection.

WASH ALL PROTECTIVE CLOTHING after use.

WHEN USING DO NOT EAT, DRINK OR SMOKE.

### Environmental protection:

DO NOT CONTAMINATE WATER with the product or its container. Do not clean application equipment near surface water. Avoid contamination via drains from farmyards and roads.

To protect aquatic organisms respect an unsprayed buffer zone to surface water bodies in line with the LERAP requirement. (LERAP Scheme not applicable in the Republic of Ireland).

DO NOT ALLOW DIRECT SPRAY from horizontal boom sprayers to fall within 5 metres of the top of the bank of a static or flowing water body, unless a Local Environmental Risk Assessment for Pesticides (LERAP) permits a narrower buffer zone, or within 1 metre of the top of a ditch which is dry at the time of application.

REPUBLIC OF IRELAND: To protect aquatic organisms respect an unsprayed buffer zone of 5 m to surface water bodies.

DO NOT ALLOW DIRECT SPRAY from hand-held sprayers to fall within 1 metre of the top of the bank of a static or flowing water body. Aim spray away from water.

This product qualifies for inclusion within the Local Environmental Risk Assessment for Pesticides (LERAP) scheme. Before each spraying operation from a horizontal boom sprayer, either a LERAP must be

carried out in accordance with HSE's published guidance or the statutory buffer zone must be maintained. The results of the LERAP must be recorded and kept available for three years. (LERAP Scheme not applicable in the Republic of Ireland).

### Storage and disposal:

KEEP AWAY FROM FOOD, DRINK AND ANIMAL FEEDING STUFFS. DO NOT RE-USE CONTAINER for any purpose.

This label is compliant with the CPA Voluntary Initiative Guidance. (UK only)



**Dow** Dow AgroSciences

# Fortress<sup>®</sup>

## FUNGICIDE

Product Registration Number: MAPP 08279/PCS No. 02364

A suspension concentrate containing 500 g/litre (41.32% w/w) quinoxifen.

A systemic fungicide for protection against POWDERY MILDEW on WINTER WHEAT, WINTER BARLEY, SPRING WHEAT, SPRING BARLEY, WINTER OATS, SPRING OATS, RYE, TRITICALE, DURUM WHEAT and SUGAR BEET.

The (COSHH) Control of Substances Hazardous to Health Regulations may apply to the use of this product at work (UK only).

**Triple Rinse Containers, Puncture and Invert to Dry at time of Use**

**READ DIRECTIONS FOR USE ON ATTACHED LEAFLET.**

**PROFESSIONAL USE ONLY**

# 1 Litre e

Dow AgroSciences Limited  
CPC2 Capital Park, Fulbourn, Cambridge, CB21 5XE.  
Telephone: +44(0)1462 457272 Fax: +44(0)1462 426605  
24 hour Emergency Telephone Number: +44 (0) 1553 761 251



Product Identifier according to Art. 18 of Reg. (EC) No 1272/2008 [CLP]: Fortress<sup>®</sup>; Quinoxifen

## WARNING

**May cause an allergic skin reaction.**

**Very toxic to aquatic life with long lasting effects.**

Wear protective gloves/protective clothing.

If skin irritation or rash occurs: Get medical advice/attention.

Collect spillage.

Dispose of contents/container to a licensed waste disposal contractor or collection site except for empty clean triple rinsed containers which can be disposed of as non-hazardous waste.

**To avoid risks to human health and the environment, comply with the instructions for use.**

MAPP 08279 / PCS No. 02364

## IMPORTANT INFORMATION

FOR USE ONLY AS AN AGRICULTURAL FUNGICIDE

Crops	Maximum Individual Dose	Maximum Total Dose	Latest Time of Application
Wheat, barley, oats, rye and triticale	0.3 litre product per hectare	0.6 litre product per hectare per crop	Before first spikelet of inflorescence visible (GS49)
Sugar beet	0.3 litre product per hectare	0.4 litre product per hectare per crop	28 days before harvest

**Read the label before use. Using this product in a manner that is inconsistent with the label may be an offence. Follow the Code of Practice for Using Plant Protection Products.**

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