

**WARFARIN**

Version 2.1

Revision Date 12/16/2010

Ref. 130000000646

This SDS adheres to the standards and regulatory requirements of the United States and may not meet the regulatory requirements in other countries.

SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

Product name : WARFARIN
MSDS Number : 130000000646

Product Use : Transported isolated intermediate used under strictly controlled conditions

Manufacturer : DuPont
1007 Market Street
Wilmington, DE 19898

Product Information : 1-800-441-7515 (outside the U.S. 1-302-774-1000)
Medical Emergency : 1-800-441-3637 (outside the U.S. 1-302-774-1139)
Transport Emergency : CHEMTREC: 1-800-424-9300 (outside the U.S. 1-703-527-3887)

SECTION 2. HAZARDS IDENTIFICATION

Emergency Overview

It inhibits prothrombin formation which results in decreased blood clotting capacity.

Warning symptoms:

Abdominal pain Gum bleeding, Nose bleeding, Bruising and haemorrhage formation

Potential Health Effects

Ingestion

Warfarin : Effects due to ingestion may include: Internal bleeding, The product inhibits prothrombin formation which results in decreased blood clotting capacity..

Repeated exposure

Warfarin : May cause harm to the unborn child. Adverse effects from repeated exposure may include: Abnormal blood clotting with easy bruising or bleeding Internal abdominal bleeding which could produce abdominal pain, bloating, low blood pressure, dizziness, light-headedness, fainting, sweating, shortness of breath, vomiting blood, blood in stools

Target Organs

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Warfarin : Bone marrow Blood

Carcinogenicity

None of the components present in this material at concentrations equal to or greater than 0.1% are listed by IARC, NTP, or OSHA, as a carcinogen.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Component	CAS-No.	Concentration
Warfarin	81-81-2	100 %

SECTION 4. FIRST AID MEASURES

- Skin contact : Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes. Wash contaminated clothing before re-use. Discard contaminated shoes.
- Eye contact : Remove contact lenses. Rinse immediately with plenty of water, also under the eyelids. Call a poison control center or doctor for treatment advice.
- Inhalation : Move to fresh air. Oxygen or artificial respiration if needed. Call a physician immediately.
- Ingestion : Rinse mouth. Induce vomiting if person is conscious. Immediately give large quantities of water to drink. Never give anything by mouth to an unconscious person. Obtain medical attention.
- General advice : Remove from exposure, lie down. When symptoms persist or in all cases of doubt seek medical advice.
- Notes to physician : Vitamin K1 is a specific antidote.

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SECTION 5. FIRE-FIGHTING MEASURES

Flammable Properties

Flash point : does not flash

Fire and Explosion Hazard : Hazardous decomposition products Carbon dioxide (CO₂) Carbon monoxideSuitable extinguishing media : Water spray, Dry powder, Foam, Carbon dioxide (CO₂)Firefighting Instructions : Wear self-contained breathing apparatus and protective suit.
Evacuate personnel to safe areas. Do not allow run-off from fire fighting to enter drains or water courses.**SECTION 6. ACCIDENTAL RELEASE MEASURES**

NOTE: Review FIRE FIGHTING MEASURES and HANDLING (PERSONNEL) sections before proceeding with clean-up. Use appropriate PERSONAL PROTECTIVE EQUIPMENT during clean-up.

Safeguards (Personnel) : Evacuate personnel to safe areas. Ensure adequate ventilation. Wear suitable protective equipment.

Spill Cleanup : Shovel into suitable container for disposal. Avoid dust formation. Clean contaminated surface thoroughly.

Accidental Release Measures : Do not flush into surface water or sanitary sewer system.
Dispose of in accordance with local regulations.**SECTION 7. HANDLING AND STORAGE**Handling (Personnel) : Avoid contact with skin, eyes and clothing. Do not breathe dust. Provide appropriate exhaust ventilation at places where dust is formed. Wear self-contained breathing apparatus and protective suit.
Avoid contact with skin, eyes and clothing. Do not breathe dust. Wash hands before breaks and immediately after handling the product. Discard contaminated shoes. Wash contaminated clothing before re-use. Routinely monitor blood clotting capacity of personnel handling this product.



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- Handling (Physical Aspects) : Keep away from open flames, hot surfaces and sources of ignition.
- Storage : Keep containers tightly closed in a cool, well-ventilated place.
Keep away from oxidising agents and strongly acid or alkaline materials.
- Storage temperature : 15 - 30 °C (59 - 86 °F)

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

- Engineering controls : Ensure adequate ventilation.
- Personal protective equipment
 - Respiratory protection : In the case of respirable dust, use self-contained breathing apparatus.
Respirator with a particle filter (EN 143)
 - Hand protection : Material: Protective gloves
 - Eye protection : Safety goggles Face-shield
 - Skin and body protection : Complete suit protecting against chemicals
Complete head face and neck protection
Boots
Apron

Exposure Guidelines
Exposure Limit Values
WARFARIN

AEL *	()	0.002 mg/m3	8 & 12 hr. TWA
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Remarks	Can be absorbed through skin.
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Warfarin			
PEL:	(OSHA)	0.1 mg/m3	8 hr. TWA
TLV	(ACGIH)	0.1 mg/m3	TWA
AEL *	(DUPONT)	0.002 mg/m3	8 & 12 hr. TWA, Skin

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* AEL is DuPont's Acceptable Exposure Limit. Where governmentally imposed occupational exposure limits which are lower than the AEL are in effect, such limits shall take precedence.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Form	: solid, crystalline
Color	: white
Odor	: none
pH	: 5.6 at > 0.2 g/l
Melting point/range	: 159 - 164 °C (318 - 327 °F)
Vapour Pressure	: 0.00003 hPa at 20 °C (68 °F)
Specific Gravity	: 0.24 at 20 °C (68 °F)
Water solubility	: 0.017 g/l at 25 °C (77 °F)
Partition coefficient: n-octanol/water	: log Pow: 2.7

SECTION 10. STABILITY AND REACTIVITY

Conditions to avoid	: Direct sources of heat. Exposure to light.
Incompatibility	: Oxidizing agents Acids, alkalies
Hazardous decomposition products	: Carbon monoxide, Carbon dioxide (CO ₂)
Hazardous reactions	: None reasonably foreseeable.

SECTION 11. TOXICOLOGICAL INFORMATION**WARFARIN**

Reproductive toxicity : Substances known to cause developmental toxicity in humans.

Further information : The product inhibits prothrombin formation which results in decreased blood clotting capacity. All symptoms are associated with haemorrhage either into body cavities or tissues.

Warfarin

Dermal LD50 : 40 mg/kg , rat



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Oral LD50	:	1.6 mg/kg , rat
Inhalation 4 h LC50	:	0.005 mg/l , rat
Skin irritation	:	rabbit
Eye irritation	:	rabbit
Skin sensitization	:	Did not cause sensitization on laboratory animals., guinea pig
Repeated dose toxicity	:	human Target Organs: Blood Prolonged blood-clotting time, Abnormal formation of blood cells, bone marrow changes
Carcinogenicity	:	Overall weight of evidence indicates that the substance is not carcinogenic.
Mutagenicity	:	Did not cause genetic damage in animals. Genetic damage in cultured mammalian cells was observed in some laboratory tests but not in others. Did not cause genetic damage in cultured bacterial cells.
Teratogenicity	:	Animal testing showed effects on embryo-foetal development at levels below those causing maternal toxicity. Foetal malformations Reduced embryo-foetal viability

SECTION 12. ECOLOGICAL INFORMATION

Aquatic Toxicity WARFARIN

Cell multiplication inhibition test NOEC	:	Scenedesmus capricornutum (fresh water algae) 0.073 mg/l
Growth inhibition NOEC	:	Scenedesmus capricornutum (fresh water algae) 0.34 mg/l

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LC50	:	Oncorhynchus mykiss (rainbow trout) 16 mg/l
96 h LC50	:	Oncorhynchus mykiss (rainbow trout) 65 mg/l

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LC50 : Lepomis macrochirus (Bluegill sunfish) 17.5 mg/l

EC50 : Daphnia magna (Water flea) 17 mg/l

Environmental Fate
WARFARIN

Biodegradability : Not readily biodegradable.

SECTION 13. DISPOSAL CONSIDERATIONS

Waste Disposal : Dispose of as special waste in compliance with local and national regulations.

Environmental Hazards : If recycling is not practicable, dispose of in compliance with local regulations.

SECTION 14. TRANSPORT INFORMATION

DOT UN number : 3027

Proper shipping name : Coumarin derivative pesticides, solid, toxic

Class : 6.1

Packing group : I

Labelling No. : 6.1

Reportable Quantity : 100 lbs Warfarin

IATA_C UN number : 3027

Proper shipping name : Coumarin derivative pesticide, solid, toxic (Warfarin)

Class : 6.1

Packing group : I

Labelling No. : 6.1

IMDG UN number : 3027

Proper shipping name : Coumarin derivative pesticide, solid, toxic (Warfarin)

Class : 6.1

Packing group : I

Labelling No. : 6.1

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SECTION 15. REGULATORY INFORMATION

TSCA Status	:	On the inventory, or in compliance with the inventory
SARA 313 Regulated Chemical(s)	:	Warfarin
CERCLA Reportable Quantity	:	100 lbs Based on the percentage composition of this chemical in the product.: Warfarin
SARA Reportable Quantity	:	100 lbs Based on the percentage composition of this chemical in the product.: Warfarin
California Prop. 65	:	WARNING! This product contains a chemical known to the State of California to cause birth defects or other reproductive harm. Warfarin
PA Right to Know Regulated Chemical(s)	:	Substances on the Pennsylvania Hazardous Substances List present at a concentration of 1% or more (0.01% for Special Hazardous Substances): Warfarin
NJ Right to Know Regulated Chemical(s)	:	Substances on the New Jersey Workplace Hazardous Substance List present at a concentration of 1% or more (0.1% for substances identified as carcinogens, mutagens or teratogens): Warfarin

SECTION 16. OTHER INFORMATION

Contact person : MSDS Coordinator, DuPont Chemicals and Fluoroproducts, Wilmington, DE 19898, (800) 441-7515

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination



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with any other materials or in any process, unless specified in the text.

Significant change from previous version is denoted with a double bar.