

**folpet**  
 \*\* folpel \*\* folpan \*\* phthaltan \*\*  
 trichloromethylthiophthalimide \*\* [Translations](#)



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## GENERAL INFORMATION

**Description:** A fungicide used to control downy mildew, powdery mildew, leaf spot and many other diseases

**Introduction:** circa 1960

### EC Directive 91/414:

Status	Annex 1
Dossier rapporteur/co-rapporteur	Italy
Date inclusion expires	30/09/2017

Approved for use (✓) or known to be used (#) in the following European countries:

	AT	BE	BG	CY	CZ	DE	DK	EE	ES	FI	FR	GR	HU	IE	IT	LT	LU	LV	MT	NL	PL	PT	RO	SE	SI	SK	UK
?	✓	■	✓	✓	✓	✓	■	■	✓	■	✓	✓	✓	✓	✓	✓	✓	■	✓	✓	✓	✓	✓	■	✓	✓	■


Also registered in: USA

### General status:




Pesticide Type	Fungicide
Chemical Group	Phthalimide
Mode of Action	Foliar applied with protective action. Acts by inhibiting normal cell division of many microorganisms.
CAS RN	133-07-3
EC Number	205-088-6
CIPAC Number	75
US EPA Chemical code	081601
Chemical Formula	C <sub>9</sub> H <sub>4</sub> Cl <sub>3</sub> NO <sub>2</sub> S
SMILES	N1(C(c2ccccc2C1=O)=O)SC(Cl)(Cl)Cl
International Chemical Identifier (InChI)	InChI=1/C9H4Cl3NO2S/c10-9(11,12)16-13-7(14)5-3-1-2-4-6(5)8(13)15/h1-4H
Structure diagram available?	Yes
Molecular Mass (g mol <sup>-1</sup> )	296.56
IUPAC Name	<i>N</i> -(trichloromethylthio)phthalimide
CAS Name	2-[(trichloromethyl)thio]-1 <i>H</i> -isoindole-1,3(2 <i>H</i> )-dione
Other status information	-
Herbicide Resistance (HRAC) Classification	Not applicable




Insecticide Resistance (IRAC) Classification	Not applicable
Fungicide Resistance (FRAC) Classification	M4
Physical State	Colourless crystals

## Formulations:

Property 	Value
Example manufacturers of products using this active	<ul style="list-style-type: none"> <li>• Makhteshim Agan</li> <li>• AgroCare</li> <li>• India Pesticides Ltd.</li> </ul>
Example products using this active	<ul style="list-style-type: none"> <li>• Folpan 80 WG</li> <li>• Petal</li> <li>• Enofol</li> <li>• Faltex</li> </ul>
Associated substances	<ul style="list-style-type: none"> <li>• <a href="#">benalaxyl</a></li> <li>• <a href="#">Bordeaux mixture</a></li> <li>• <a href="#">cymoxanil</a></li> <li>• <a href="#">prochloraz</a></li> <li>• <a href="#">propiconazole</a></li> <li>• <a href="#">triadimenol</a></li> </ul>
UK LERAP status	No UK approval for use
Formulation and application details	Often supplied as water dispersible granules that are mixed with water and applied as a spray.





## ENVIRONMENTAL FATE

Property 	Value	Source/Quality Score/Other Information 	Interpretation 
Solubility - In water at 20°C (mg l <sup>-1</sup> )	0.8	A5	Low
Solubility - In organic solvents at 20°C (mg l <sup>-1</sup> )	34000	A5 - Acetone	-
	1400	A5 - n-Octanol	-
	3100	A5 - Methanol	-
	450	A5 - Heptane	-
Melting Point (°C)	178.5	A5	-
Boiling Point (°C)	Decomposes before boiling	A5	-
Degradation point (°C)	184	A5	-
Flashpoint (°C)	Not highly flammable	A5	-
Octanol-water partition coefficient at pH 7, 20°C	P:	1.05 X 10 <sup>03</sup>	Calculated
	Log P:	3.02	A5

Bulk density (g ml <sup>-1</sup> )/Specific gravity	1.72	A5	-	
Dissociation constant (pKa) at 25°C	Not applicable Note: No dissociation	A5	-	
Vapour pressure at 25°C (mPa)	2.10 X 10 <sup>-02</sup>	A5	Volatile	
Henry's law constant at 25°C (Pa m <sup>3</sup> mol <sup>-1</sup> )	8.00 X 10 <sup>-03</sup>	A5	Non-volatile	
Henry's law constant at 20°C (dimensionless)	1.57 X 10 <sup>-04</sup>	Q2	Volatile	
Soil degradation (days) (aerobic)	DT50 (typical):	4.7	A5	Non-persistent
	DT50 (lab at 20°C):	4.7	A5	Non-persistent
	DT50 (field):	3	A5	Non-persistent
	DT90 (lab at 20°C):	5.4	A5	-
	DT90 (field):	-	-	-
	Note:	EU dossier lab studies DT50 range 0.2-4.3 days, DT90 range 0.7-12.8 days		
Aqueous photolysis DT50 (days) at pH 7	Value:	Stable	A5	Stable
	Note:	Not a significant degradation route		
Aqueous hydrolysis DT50 (days) at 20°C and pH 7	Value:	0.05	A5	Non-persistent
	Note:	Rapid and pH sensitive: DT50 2.6 hours at pH 5, 1 minute at pH 9, all at 25 degC		
Water-Sediment DT50 (days)	0.02	A5	Fast	
Water phase only DT50 (days)	0.02	A5	Fast	
GUS leaching potential index 	1.02	Calculated	Low leachability	
SCI-GROW groundwater index (µg l <sup>-1</sup> ) for a 1 kg ha <sup>-1</sup> or 1 l ha <sup>-1</sup> application rate 	Value:	3.53 X 10 <sup>-03</sup>	Calculated	-
	Note:	-		
Potential for particle bound transport index 	-	Calculated	Low	
Koc - Organic-carbon sorption constant (ml g <sup>-1</sup> )	304	A3	Moderately mobile	
		pH sensitivity: Note: EU dossier worst case estimate; Other sources: 15.0 mL/g (DW3)		
Freundlich isotherm	Kf:	-	-	-
	1/n:	-	-	-
	Note:	-		

Maximum UV-vis absorption L mol <sup>-1</sup> cm <sup>-1</sup>	[Neutral solution: 47100, 7900, 1780, 1720 at 223, 236, 295, 300nm], [Acidic solution: 52600, 8410, 1770, 1720 at 223, 237, 296, 301nm], [Basic solution: 19900, 11300, 7410, 1810, 1650, 1320 at 225, 238,247, 280, 289, 301nm]	A5	-
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### Key metabolites:

Metabolite	Formation Medium	Estimated Maximum Occurrence Fraction	91/414 Relevancy 
phthalimide 	Soil	0.649	Major fraction, Relevant
phthalic acid 	Soil	0.166	Major fraction, Not relevant
phthalamic acid 	Soil	0.167	Major fraction, Not relevant

### Other known metabolites:

Metabolite name and reference	Aliases	Formation Medium / Rate	Estimated Maximum Occurrence Fraction
trichloromethylsulfenic acid	-	Water/sediment (Hydrolysis)	-
trichloromethylmercaptan	-	Water/sediment (Hydrolysis)	-
thiophosgene	-	Soil; Water/sediment (Hydrolysis)	-
carbon oxysulfide	-	Water/sediment (Hydrolysis)	-
2-cyanobenzoic acid	-	Water	0.397
benzamide	-	Water	0.102

## ECOTOXICOLOGY




Property 	Value	Source/Quality Score/Other Information 	Interpretation 
Bio-concentration factor	BCF: 56 CT50 (days): 0.6	A5 Whole fish	Low potential
Bioaccumulation potential	-	Calculated	Low
Mammals - Acute oral LD50 (mg kg <sup>-1</sup> )	> 2000	A5 Rat	Moderate
Mammals - Short term dietary NOEL (mg kg <sup>-1</sup> ):	44.5	A5 Rat	High

	(ppm diet):	-	-		
Birds - Acute LD50 (mg kg <sup>-1</sup> )		> 2510		A5 <i>Colinus virginianus</i>	Low
Birds - Short term dietary (LC50/LD50)		> 1127 mg/kg bw/day		A5 <i>Colinus virginianus</i>	-
Fish - Acute 96 hour LC50 (mg l <sup>-1</sup> )		0.233		A5 <i>Oncorhynchus mykiss</i>	Moderate
Fish - Chronic 21 day NOEC (mg l <sup>-1</sup> )		-		-	-
Aquatic invertebrates - Acute 48 hour EC50 (mg l <sup>-1</sup> )		0.68		A5 <i>Daphnia magna</i>	Moderate
Aquatic invertebrates - Chronic 21 day NOEC (mg l <sup>-1</sup> )		0.002		F3 <i>Daphnia magna</i> , LOEC	-
Aquatic crustaceans - Acute 96 hour LC50 (mg l <sup>-1</sup> )		12.1		F3 <i>Americamysis bahia</i>	Moderate
Sediment dwelling organisms - Acute 96 hour LC50 (mg l <sup>-1</sup> )		-		-	-
Sediment dwelling organisms - Chronic 28 day NOEC, static, water (mg l <sup>-1</sup> )		-		-	-
Sediment dwelling organisms - Chronic 28 day NOEC, sediment (mg kg <sup>-1</sup> )		-		-	-
Aquatic plants - Acute 7 day EC50, biomass (mg l <sup>-1</sup> )		-		-	-
Algae - Acute 72 hour EC50, growth (mg l <sup>-1</sup> )		> 10		A5 <i>Scenedesmus subspicatus</i>	Moderate
Algae - Chronic 96 hour NOEC, growth (mg l <sup>-1</sup> )		-		-	-
Honeybees - Acute 48 hour LD50 (µg bee <sup>-1</sup> )		> 200		A5 Contact	Low
Earthworms - Acute 14 day LC50 (mg kg <sup>-1</sup> )		> 500		A5 <i>Eisenia foetida</i> , corr	Moderate
Earthworms - Chronic 14 day NOEC, reproduction (mg kg <sup>-1</sup> )		5.18		A5 <i>Eisenia foetida</i> corr	Moderate
Other soil macro-organisms - e.g. Collembola	LR50 / EC50 / NOEC / % Effect	-		-	-
Other arthropod (1)	LR50 g ha <sup>-1</sup> :	-		-	-
	% Effect:	32.5 -75		Mortality Parasitism Dose: 2.0 kg ha <sup>-1</sup> A5 <i>Aphidius rhopalosiphii</i> , adult	Moderately harmful
Other arthropod (2)	LR50 g ha <sup>-1</sup> :	-		-	-

	% Effect:	0 9.2	Mortality Egg production Dose: 5.25 kg ha <sup>-1</sup> A5 <i>Typhlodromus pyri</i>	Harmless
Soil micro-organisms		Nitrogen mineralisation: No significant effect Carbon mineralisation: No significant effect	A5 [Dose: 15.93 kg ha <sup>-1</sup> ]	-
Mesocosm study data	NOEAEC mg l <sup>-1</sup> :	-	-	-
	NOEAEC mg l <sup>-1</sup> :	-	-	-

## HUMAN HEALTH AND PROTECTION

### General:

Property 	Value	Source/Quality Score/Other Information 	Interpretation 
Mammals - Acute oral LD50 (mg kg <sup>-1</sup> )	> 2000	A5 Rat	Moderate
Mammals - Dermal LD50 (mg kg <sup>-1</sup> body weight)	> 2000	A5 Rat	-
Mammals - Inhalation LC50 (mg l <sup>-1</sup> )	1.89	A5 Rat	-
ADI - Acceptable Daily Intake (mg kg <sup>-1</sup> bw day <sup>-1</sup> )	0.1	A5 Dog, SF=100	-
ARfD - Acute Reference Dose (mg kg <sup>-1</sup> bw day <sup>-1</sup> )	0.1	A5 Rabbit, SF=100	-
AOEL - Acceptable Operator Exposure Level - Systemic (mg kg <sup>-1</sup> bw day <sup>-1</sup> )	0.1	A5 Rat, 90 day, SF=100	-
Dermal penetration studies (%)	10.0	A5	-
Dangerous Substances Directive 76/464	-	-	-
Exposure Limits	-	-	-
Exposure Routes	Public: [Negligible risk to bystanders] Occupational: [Potential risk to operators and other workers not utilising PPE/PPC]		
Examples of European MRLs (mg kg <sup>-1</sup> )	Value: Wine grapes: 5.0; Strawberries, soft fruit and pome fruit: 3.0; Tomatoes, lettuce, beans, cherries, barley grains and wheat grains: 2.0; Potatoes and onions: 0.1; Other vegetables, other fruit and other cereal grains: 0.02 Note: [Current May 2007.] [Data for tomatoes, beans, pomes, soft fruit is sum of captan and folpet.] For the EU pesticides database <a href="#">click here</a>		
Drinking Water MAC (µg l <sup>-1</sup> )	0.1	EU Dir 89/778/EC limit; A5	-

## Health issues:

Carcinogen	Endocrine disrupter	Reproduction / development effects	Acetyl cholinesterase inhibitor	Neurotoxicant	Respiratory tract irritant	Skin irritant	Eye irritant
✓	-	-	X	X	?	✓	✓

General human health issues [No further information available]

- ✓ : Yes, known to cause a problem
- X : No, known not to cause a problem
- ? : Possibly, status not identified
- : No data

## Handling issues:

Property	Value	Source/Quality Score/Other Information	Interpretation
General	[Prevent generation of dust], [Not explosive], [IMDG Transport Code is usually 9]		
EC Risk Classification	[Carcinogen category 3: R40], [Xn - Harmful: R20], [Xi - Irritant: R36, R43], [N - Dangerous for the environment: R50]		
EC Safety Classification	S2, S36/37, S46, S61		
WHO Classification	U	-	Unlikely to present acute hazard in normal use
US EPA Classification (formulation)	IV	-	Caution - Not acutely toxic
UN Number	Usually 3077		
Waste disposal & packaging	[Usually Packaging Group III (minor danger)]		

## TRANSLATIONS

Language	Name
English	folpet
French	folpet
German	Folpet
Danish	folpet
Italian	folpet
Spanish	folpet
Greek	folpet
Slovenian	folpet
Polish	folpet
Swedish	folpet
Hungarian	folpet

Dutch

folpet

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