

chlorothalonil (Ref: DS 2787)

** TPN ** tetrachloroisophthalonitrile **
m-TCPN ** HSR002825 ** [Translations](#)



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GENERAL INFORMATION

Description: A fungicide used to control a wide range of diseases on a broad range of crops. Also used as a wood preservative.

Introduction: 1997

EC Directive 91/414:

Status	Annex 1
Dossier rapporteur/co-rapporteur	Netherlands
Date inclusion expires	28/02/2016

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: Australia, USA

General status:

Pesticide Type	Fungicide
Chemical Group	Chloronitrile
Mode of Action	Non-systemic, broad-spectrum, foliar action with some protectant properties. Acts by preventing spore germination and zoospore motility
CAS RN	1897-45-6
EC Number	217-588-1
CIPAC Number	288
US EPA Chemical code	081901
Chemical Formula	C ₈ Cl ₄ N ₂
SMILES	Clc1c(C#N)c(Cl)c(C#N)c(Cl)c1Cl
International Chemical Identifier (InChI)	InChI=1/C8Cl4N2/c9-5-3(1-13)6(10)8(12)7(11)4(5)2-14
Structure diagram available?	Yes
Molecular Mass (g mol ⁻¹)	265.91
IUPAC Name	tetrachloroisophthalonitrile
CAS Name	2,4,5,6-tetrachloro-1,3-benzenedicarbonitrile
Other status information	-
Herbicide Resistance (HRAC) Classification	Not applicable

Insecticide Resistance (IRAC) Classification	Not applicable
Fungicide Resistance (FRAC) Classification	M5
Physical State	White crystals

Formulations:

Property

Example manufacturers of products using this active

Value

- AgriGuard
- Certis
- DuPont
- Nufarm
- Scotts
- Syngenta
- Teliton
- Walabi

Example products using this active

- Alto Elite
- Amistar Opti
- Bravo 500
- Cherokee
- Credo
- Folio
- Joules
- Merlin
- Midas
- Repulse

Associated substances

- [azoxystrobin](#)
- [cyproconazole](#)
- [flutriafol](#)
- [mancozeb](#)
- [picoxystrobin](#)
- [pyrimethanil](#)







UK LERAP status




LERAP Category B, Broadcast Air Assisted LERAP

Formulation and application details

Usually supplied as a soluble concentrate that is 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 ⁻¹)	0.81	A5		Low
Solubility - In organic solvents at 20°C (mg l ⁻¹)	13800	A5 - Ethyl acetate		-
	20600	C4 - Acetone		-
	1360	A5 - Methanol		-
	74400	A5 - Xylene		-

Melting Point (°C)		252.1	A5	-
Boiling Point (°C)		350	A5	-
Degradation point (°C)		-	-	-
Flashpoint (°C)		Not highly flammable	A5	-
Octanol-water partition coefficient at pH 7, 20°C	P:	8.71 X 10 ⁰²	Calculated	-
	Log P:	2.94	A5	Moderate
Bulk density (g ml ⁻¹)/Specific gravity		1.74	A5	-
Dissociation constant (pKa) at 25°C		Not applicable	A5	-
	Note:	No dissociation		
Vapour pressure at 25°C (mPa)		0.076	A5	Volatile
Henry's law constant at 25°C (Pa m ³ mol ⁻¹)		2.50 X 10 ⁻⁰²	A5	Non-volatile
Henry's law constant at 20°C (dimensionless)		1.36 X 10 ⁻⁰⁵	K3	Moderately volatile
Soil degradation (days) (aerobic)	DT50 (typical):	22	A5	Non-persistent
	DT50 (lab at 20°C):	15.7	A5	Non-persistent
	DT50 (field):	44	A5	Moderately persistent
	DT90 (lab at 20°C):	51.6	A5	-
	DT90 (field):	-	-	-
	Note:	EU dossier lab studies DT50 range 0.3-87 days, DT90 range 1.0-287 days; field studies DT50 range 18-77 days; Other sources: 30 days (DW3)		
Aqueous photolysis DT50 (days) at pH 7	Value:	65	A4	Stable
	Note:	-		
Aqueous hydrolysis DT50 (days) at 20°C and pH 7	Value:	Stable	A5	Very persistent
	Note:	Stable pH 5 to pH 7, DT50 16-38 days at pH 9, 20 degC		
Water-Sediment DT50 (days)		0.1	A5	Fast
Water phase only DT50 (days)		0.1	B5	Fast
GUS leaching potential index 		1.44	Calculated	Low leachability
SCI-GROW groundwater index (µg l ⁻¹) for a 1 kg ha ⁻¹ or 1 l ha ⁻¹ application rate 	Value:	3.24 X 10 ⁻⁰²	Calculated	-
	Note:	-		
Potential for particle bound transport index 		-	Calculated	Medium

Koc - Organic-carbon sorption constant (ml g ⁻¹)	850	W4	Slightly mobile
	pH sensitivity:		
	Note: EU dossier Koc range 300-7000 mL/g; Other data source: 1380 mL/g (DW3)		
Freundlich isotherm	Kf: 500	R4	-
	¹ / _n : 0.64		-
	Note		Mean of 3 soils. Ando soil OC=5.2% Kf=700; Gray lowland soil OC=1.4% Kf=500; Light Ando soil OC=1.1% kf=300.
Maximum UV-vis absorption L mol ⁻¹ cm ⁻¹	[232nm = 62390; 312nm = 1116; 324nm = 1507]	A5	-

Key metabolites:

Metabolite	Formation Medium	Estimated Maximum Occurrence Fraction	91/414 Relevancy 
4-hydroxy-2,5,6-trichloroisophthalonitrile (Ref: SDS-3701) 	Soil	0.320	Major fraction, Relevant
2-amido-3,5,6-trichloro-4-cyanobenzenesulphonic acid (Ref: R417888) 	Soil	0.200	Major fraction, Relevant
3-carbamyl-2,4,5-trichlorobenzoic acid (Ref: SDS 46851) 	Soil	0.132	Major fraction, Relevant

Other known metabolites:

Metabolite name and reference	Aliases	Formation Medium / Rate	Estimated Maximum Occurrence Fraction
-	R471811; Compound 13	Soil	0.110
-	R419492	Soil	0.124
(Ref: SDS-19221)	-	Soil	0.100
(Ref: SDS-46851)	R611965	Soil; Groundwater; Rat (Urinary)	0.132

Note: Rat LD50 (oral) >5000

ECOTOXICOLOGY




Property 	Value	Source/Quality Score/Other Information 	Interpretation 
Bio-concentration factor	BCF: 100	A5	Threshold for concern
	CT50 (days): 5		-

Bioaccumulation potential	-	Calculated	Low
Mammals - Acute oral LD50 (mg kg ⁻¹)	> 5000	A5 Rat	Low
Mammals - Short term dietary NOEL (mg kg ⁻¹):	3	B4	High
(ppm diet):	10		-
Birds - Acute LD50 (mg kg ⁻¹)	> 2000	A5 <i>Coturnix japonica</i>	Moderate
Birds - Short term dietary (LC50/LD50)	> 5200 mg/kg feed	A5 <i>Coturnix japonica</i>	-
Fish - Acute 96 hour LC50 (mg l ⁻¹)	0.038	A5 <i>Oncorhynchus mykiss</i>	High
Fish - Chronic 21 day NOEC (mg l ⁻¹)	0.003	A5 <i>Oncorhynchus mykiss</i>	-
Aquatic invertebrates - Acute 48 hour EC50 (mg l ⁻¹)	0.084	A5 <i>Daphnia magna</i>	High
Aquatic invertebrates - Chronic 21 day NOEC (mg l ⁻¹)	0.009	A5 <i>Daphnia magna</i>	-
Aquatic crustaceans - Acute 96 hour LC50 (mg l ⁻¹)	-	-	-
Sediment dwelling organisms - Acute 96 hour LC50 (mg l ⁻¹)	0.061	A5 <i>Chironomus riparius</i>	High
Sediment dwelling organisms - Chronic 28 day NOEC, static, water (mg l ⁻¹)	0.04	A5 <i>Chironomus riparius</i>	Moderate
Sediment dwelling organisms - Chronic 28 day NOEC, sediment (mg kg ⁻¹)	-	-	-
Aquatic plants - Acute 7 day EC50, biomass (mg l ⁻¹)	0.29	C4 <i>Lemna gibba</i>	Moderate
Algae - Acute 72 hour EC50, growth (mg l ⁻¹)	0.21	L2 <i>Raphidocelis subcapitata</i>	Moderate
Algae - Chronic 96 hour NOEC, growth (mg l ⁻¹)	0.033	A5 <i>Selenastrum capricornutum</i>	Moderate
Honeybees - Acute 48 hour LD50 (µg bee ⁻¹)	> 40	A5 Oral	Moderate
Earthworms - Acute 14 day LC50 (mg kg ⁻¹)	268.5	A5 <i>Eisenia foetida</i>	Moderate
Earthworms - Chronic 14 day NOEC, reproduction (mg kg ⁻¹)	25.0	A5 <i>Eisenia foetida</i> , 5% OM	Moderate
Other soil macro-organisms - e.g. Collembola	LR50 / EC50 / NOEC / % Effect	-	-
Other arthropod (1)	LR50 g ha ⁻¹ :	48 hour L3 <i>Aphidius rhopalosiphi</i>	Harmless at 1 kg ha ⁻¹

	% Effect:	-	-	-
Other arthropod (2)	LR50 g ha ⁻¹ :	Harmful	[Dose: 900 g/ha] AA3 <i>Typhlodromus pyri</i>	-
	% Effect:	-	-	-
Soil micro-organisms		Nitrogen mineralisation: No significant effect Carbon mineralisation: No significant effect	A5 [Dose: 4.8 mg ha ⁻¹ soil]	-
Mesocosm study data	NOEAEC mg l ⁻¹ :	-	-	-
	NOEAEC mg l ⁻¹ :	-	-	-

HUMAN HEALTH AND PROTECTION

General:

Property 	Value	Source/Quality Score/Other Information 	Interpretation 
Mammals - Acute oral LD50 (mg kg ⁻¹)	> 5000	A5 Rat	Low
Mammals - Dermal LD50 (mg kg ⁻¹ body weight)	> 2000	A5 Rabbit	-
Mammals - Inhalation LC50 (mg l ⁻¹)	0.1	A5 Rat, 4hr	-
ADI - Acceptable Daily Intake (mg kg ⁻¹ bw day ⁻¹)	0.015	A5 Rat, SF=100	-
ARfD - Acute Reference Dose (mg kg ⁻¹ bw day ⁻¹)	0.6	A5 Rat, SF=100	-
AOEL - Acceptable Operator Exposure Level - Systemic (mg kg ⁻¹ bw day ⁻¹)	0.009	A5 Rat, SF=100	-
Dermal penetration studies (%)	0.02-1.2	A5 (Diluted spray-Conc)	-
Dangerous Substances Directive 76/464	-	-	-
Exposure Limits	-	-	-
Exposure Routes	Public: - Occupational: -		
Examples of European MRLs (mg kg ⁻¹)	Value: Celery and soft fruit: 10.0; Broccoli, wine grapes, cabbage and cauliflower: 3.0; Peas (with pods): 2.0; Cucumber, melons (not watermelons), pumpkins, winter squash, carrots, pomes, apricots, nectarines, peaches and table grapes: 1.0; Brussel spouts, onions and garlic: 0.5; Peas (edible part): 0.3; Barley, oat, rye and wheat grains: 0.1; Beans (edible part): 0.05; Other cereal grains, other fruit and other veg: 0.01		

Note: [Current May 2007.]
For the EU pesticides database [click here](#)

Drinking Water MAC ($\mu\text{g l}^{-1}$) - - -

Health issues:

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

General human health issues [Cases of contact dermatitis have been reported]

- ✓ : 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	[Avoid generating spray mists/dust], [Not explosive], [IMDG Transport Code is usually 9]		
EC Risk Classification	[Carcinogen category 3: R40], [T+ - Very toxic: R26], [Xi - Irritant: R37, R41, R43], [N - Dangerous for the environment: R50, R53]		
EC Safety Classification	S1/2, S28, S36/37/39, S45, S60, S61		
WHO Classification	U	-	Unlikely to present acute hazard in normal use
US EPA Classification (formulation)	II	-	Warning - Moderately toxic
UN Number	Usually 3082		
Waste disposal & packaging	[Usually Packaging Group III (minor danger)]		

TRANSLATIONS

Language	Name
English	chlorothalonil
French	chlorothalonil
German	Chlorthalonil
Danish	chlorothalonil
Italian	clorotalonil
Spanish	clorotalonil
Greek	chlorothalonil

Slovenian	klortalonil
Polish	chlorotalonil
Swedish	-
Hungarian	chlotalonil
Dutch	chloorthalonil

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