











Herbicide Resistance (HRAC) Classification	Not applicable
Insecticide Resistance (IRAC) Classification	Not applicable
Fungicide Resistance (FRAC) Classification	M3
Physical State	Grey to yellow coloured powder

## Formulations:

Property 	Value
Example manufacturers of products using this active	<ul style="list-style-type: none"> <li>• AgriGuard</li> <li>• Certis</li> <li>• Dow AgroSciences</li> <li>• DuPont</li> <li>• Headland</li> <li>• Interfarm</li> <li>• Nufarm</li> <li>• Sipcam</li> <li>• Syngenta</li> </ul>
Example products using this active	<ul style="list-style-type: none"> <li>• Fubol Gold</li> <li>• Dithane Dry Flowable</li> <li>• Dithane 945</li> <li>• Karamate DryFlo</li> <li>• Manzate 75WG</li> <li>• Matilda WG</li> <li>• Penncozeb</li> </ul>
Associated substances	<ul style="list-style-type: none"> <li>• <a href="#">sodium lignosulfonate</a></li> <li>• <a href="#">benalaxyl</a></li> <li>• <a href="#">benthiavalicarb</a></li> <li>• <a href="#">chlorothalonil</a></li> <li>• <a href="#">cymoxanil</a></li> <li>• <a href="#">dimethomorph</a></li> </ul>
UK LERAP status	LERAP Category B (may vary across mixtures)
Formulation and application details	Often supplied as wettable granules and powders that are mixed with water and used as a spray.


## ENVIRONMENTAL FATE

Property 	Value	Source/Quality Score/Other Information 	Interpretation 
Solubility - In water at 20°C (mg l <sup>-1</sup> )	6.2	G4	Low
Solubility - In organic solvents at 20°C (mg l <sup>-1</sup> )	Insoluble	A4 - Most organic solvents	-
Melting Point (°C)	Decomposes before melting	A5	-
Boiling Point (°C)	Decomposes before boiling	A5	-
Degradation point (°C)	172	L3	-

Flashpoint (°C)		Not highly flammable	A5	-
Octanol-water partition coefficient at pH 7, 20°C	P:	2.14 X 10 <sup>01</sup>	Calculated	-
	Log P:	1.33	A5	Low
Bulk density (g ml <sup>-1</sup> )/Specific gravity		1.98	A5	-
Dissociation constant (pKa) at 25°C		10.3 Note: Very weak acid	A5	-
Vapour pressure at 25°C (mPa)		0.013	A5	Volatile
Henry's law constant at 25°C (Pa m <sup>3</sup> mol <sup>-1</sup> )		5.90 X 10 <sup>-04</sup>	A5	Non-volatile
Henry's law constant at 20°C (dimensionless)		1.76 X 10 <sup>-10</sup>	Q2	Non-volatile
Soil degradation (days) (aerobic)	DT50 (typical):	0.1 	A5	Non-persistent
	DT50 (lab at 20°C):	0.1	A5	Non-persistent
	DT50 (field):	18	H4	Non-persistent
	DT90 (lab at 20°C):	0.5	A5	-
	DT90 (field):	-	-	-
	Note:	EU dossier lab studies DT50 range 1-3 hours, Dt90 range 2- 25 hours		
Aqueous photolysis DT50 (days) at pH 7	Value:	Stable	A3	Stable
	Note:	Not a significant route of degradation		
Aqueous hydrolysis DT50 (days) at 20°C and pH 7	Value:	1.3	A4	Non-persistent
	Note:	pH variable: DT50 2-36 hours at pH 5, 5.5-55 hours at pH 7, 15 hours at pH 9		
Water-Sediment DT50 (days)		76	Q3	Moderately fast
Water phase only DT50 (days)		0.2	A5	Fast
 GUS leaching potential index		-1.00	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:	2.84 X 10 <sup>-06</sup>	Calculated	-
	Note:	-		
 Potential for particle bound transport index		-	Calculated	Low
Koc - Organic-carbon sorption constant (ml g <sup>-1</sup> )		998	A5	Slightly mobile
		pH sensitivity: None		
		Note: EU dossier Koc range 363 - 2334 mL/g		

Freundlich isotherm	Kf:	9.47	A5	-
	$1/n$ :	0.73		-
	Note	Kf range 7.26-11.67		
Maximum UV-vis absorption L mol <sup>-1</sup> cm <sup>-1</sup>		-	-	-

### Key metabolites:

Metabolite	Formation Medium	Estimated Maximum Occurrence Fraction	91/414 Relevancy 
ethylenethiourea	Soil	0.031	Minor fraction, Relevant
ethyleneurea	Soil	0.085	Minor fraction, Relevant
ethylene bisisothiocyanate sulphide	Soil	0.082	Minor fraction, Relevant

### Other known metabolites:

Metabolite name and reference	Aliases	Formation Medium / Rate	Estimated Maximum Occurrence Fraction
ethylene thiuram disulphide	ETD	Soil	Very low




## ECOTOXICOLOGY

Property 	Value	Source/Quality Score/Other Information 	Interpretation 
Bio-concentration factor	BCF: 3.2 CT50 (days): Not available	Q2 EU dossier states low risk	Low potential -
Bioaccumulation potential	-	Calculated	Low
Mammals - Acute oral LD50 (mg kg <sup>-1</sup> )	> 5000	A5 Rat	Low
Mammals - Short term dietary NOEL (mg kg <sup>-1</sup> ):	-	-	-
	(ppm diet): -		-
Birds - Acute LD50 (mg kg <sup>-1</sup> )	> 2000	A4 median	Moderate
Birds - Short term dietary (LC50/LD50)	> 860 mg/kg bw/day	A4 <i>Colinus virginianus</i>	-
Fish - Acute 96 hour LC50 (mg l <sup>-1</sup> )	0.074	A5 <i>Oncorhynchus mykiss</i>	High
Fish - Chronic 21 day NOEC (mg l <sup>-1</sup> )	0.66	A5 <i>Oncorhynchus mykiss</i>	-
Aquatic invertebrates - Acute 48 hour EC50 (mg l <sup>-1</sup> )	0.073	A5 <i>Daphnia magna</i>	High

Aquatic invertebrates - Chronic 21 day NOEC (mg l <sup>-1</sup> )	0.0073		A5 <i>Daphnia magna</i>	-
Aquatic crustaceans - Acute 96 hour LC50 (mg l <sup>-1</sup> )	-		-	-
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> )	0.044		A5 <i>Pseudokirchneriella subcapitata</i>	Moderate
Algae - Chronic 96 hour NOEC, growth (mg l <sup>-1</sup> )	-		-	-
Honeybees - Acute 48 hour LD50 (µg bee <sup>-1</sup> )	140.6		A5 Oral	Low
Earthworms - Acute 14 day LC50 (mg kg <sup>-1</sup> )	> 299.1		A5 <i>Eisenia foetida</i>	Moderate
Earthworms - Chronic 14 day NOEC, reproduction (mg kg <sup>-1</sup> )	20.0		A5 <i>Eisenia foetida</i>	Moderate
Other soil macro-organisms - e.g. Collembola	LR50 / EC50 / NOEC / % Effect	-	-	-
Other arthropod (1)	LR50 g ha <sup>-1</sup> : % Effect:	Harmful 75	[Dose: 480 g/ha] AA2 <i>Typhlodromus pyri</i>	- Long term effect Dose: 36 kg ha <sup>-1</sup> A5 <i>Typhlodromus pyri</i> , adult
Other arthropod (2)	LR50 g ha <sup>-1</sup> : % Effect:	Harmless -0.4	[Dose: 480 g/ha] AA2 <i>Chrysoperla carnea</i>	- Mortality Dose: 2.6 kg ha <sup>-1</sup> A5 <i>Aphidius rhopalosiphi</i>
Soil micro-organisms		Nitrogen mineralisation: No significant effect Carbon mineralisation: No significant effect	A5 [Dose: 4.2 kg ha <sup>-1</sup> ]	-
Mesocosm study data	NOEAEC mg l <sup>-1</sup> : NOEAEC mg l <sup>-1</sup> :	0.032 -	A5 Invertebrates and phytoplankton	- -

## HUMAN HEALTH AND PROTECTION

### General:

<b>Property</b> 	<b>Value</b>	<b>Source/Quality Score/Other Information</b> 	<b>Interpretation</b> 
Mammals - Acute oral LD50 (mg kg <sup>-1</sup> )	> 5000	A5 Rat	Low
Mammals - Dermal LD50 (mg kg <sup>-1</sup> body weight)	> 2000	A5 Rat	-
Mammals - Inhalation LC50 (mg l <sup>-1</sup> )	> 5.14	A5 Rat	-
ADI - Acceptable Daily Intake (mg kg <sup>-1</sup> bw day <sup>-1</sup> )	0.05	A5 Rat, SF=100	-
ARfD - Acute Reference Dose (mg kg <sup>-1</sup> bw day <sup>-1</sup> )	0.6	A5 Rat	-
AOEL - Acceptable Operator Exposure Level - Systemic (mg kg <sup>-1</sup> bw day <sup>-1</sup> )	0.035	A5	-
Dermal penetration studies (%)	0.11-0.24	A5	-
Dangerous Substances Directive 76/464	List II	-	-
Exposure Limits	-	-	-
Exposure Routes	Public: - Occupational: -	-	-
Examples of European MRLs (mg kg <sup>-1</sup> )	Value: Currants, gooseberries, citrus and lettuce: 5.0; Tomatoes and pome fruit: 3.0; Apricots, nectarines, peaches, grapes, strawberries, barley grains and oat grains: 2.0; Brassicas, beans (with pods), peas (with pods), cherries, plums, rye grains and wheat grains: 1.0; Onions, garlic, cucumbers, melons (not watermelons), pumpkins, summer squash and celery: 0.5; Carrots: 0.2; Potatoes, beans (edible part) and peas (edible part): 0.1; Other vegetables, other fruit and other cereal grains: 0.05  Note: [Current May 2007.] [Expressed as carbon disulphide.] For the EU pesticides database <a href="#">click here</a>	-	-
Drinking Water MAC (µg l <sup>-1</sup> )	-	-	-

### Health issues:

<b>Carcinogen</b>	<b>Endocrine disrupter</b>	<b>Reproduction / development effects</b>	<b>Acetyl cholinesterase inhibitor</b>	<b>Neurotoxicant</b>	<b>Respiratory tract irritant</b>	<b>Skin irritant</b>	<b>Eye irritant</b>
✓	?	✓	X	X	✓	?	✓
General human health issues		[May cause ovarian hypertrophy]					

- ✓ : 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 	[Not explosive], [IMDG Transport Code is usually 9]		
EC Risk Classification 	[Reproduction risk category 3: R63], [Xi - Irritant: 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	Variable with product, usually 3077 or 3082		
Waste disposal & packaging 	[Usually Packaging Group III (minor danger)]		

## TRANSLATIONS

Language	Name
English	mancozeb
French	mancozebe
German	Mancozeb
Danish	mancozeb
Italian	mancozeb
Spanish	mancoceb
Greek	mancozeb
Slovenian	mankozeb
Polish	mankozeb
Swedish	mankozeb
Hungarian	mancozeb
Dutch	mancozeb

Site last updated: Monday 29 November 2010

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**Acknowledgements:** The PPDB website has been compiled from the EMA/[EMA On-line](#) pesticide properties database, with additional input from the EU-funded [FOOTPRINT](#) project and others. Special thanks are due to Don Wauchope, Nick Jarvis (SLU Sweden), Stefan Reichenberger (University of Giessen, Germany) and Benoit Riial (ARVALIS-Institut du Végétal, France) for their assistance in sourcing additional data. The funding of FOOTPRINT by the European Commission as part of its Framework Programme for Research and Development is also gratefully acknowledged.