



Environmental  
Protection Authority  
*Te Mana Rauhi Taiao*

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## STAFF ADVICE

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### APP204116 – Mortein Powergard All in One Insect Killer

November 2020

## 1. Executive Summary

- 1.1 Mortein Powergard All in One Insect Killer is an aerosol containing imiprothrin, bioallethrin and permethrin at 0.2 g/kg, 1.2 g/kg and 0.5 g/kg respectively as the active ingredients, plus other components. It is intended for use as an insecticide for the control of flying and crawling insects in the home.
- 1.2 The hazard classifications of Mortein Powergard All in One Insect Killer determined by the EPA are: 2.1.2A, 6.3B, 6.4A, 6.5B, 9.1A and 9.4B.
- 1.3 With the full suite of controls in place, the risks associated with the use of Mortein Powergard All in One Insect Killer can be adequately managed.

## 2. Application Context

### Background

- 2.1 Mortein Powergard All in One Insect Killer is an aerosol containing imiprothrin, bioallethrin and permethrin at 0.2 g/kg, 1.2 g/kg and 0.5 g/kg respectively as the active ingredients, plus other components. It is intended for use as an insecticide for the control of flying and crawling insects in the home.
- 2.2 The formulation of Mortein Powergard All in One Insect Killer is considered confidential by the applicant.
- 2.3 The active ingredients are each present individually in various approved substances and in higher concentrations than in Mortein Powergard All in One Insect Killer. Imiprothrin, bioallethrin and permethrin are also the active ingredients in the approved substance RB-2-143 (HSR100608), which is an aerosol insecticide for home use and currently the only approved substance containing the three active ingredients together.
- 2.4 Mortein Powergard All in One Insect Killer has previously been assessed via the s 26 Statutory Determination process with application number APP204017. This assessment determined the hazard classifications of this substance and that a new approval is required under the HSNO Act 1996.
- 2.5 A Category A assessment of Mortein Powergard All in One Insect Killer is appropriate because substances containing the active ingredients, either individually or together, at similar or higher concentrations have already been approved. However, Mortein Powergard All in One Insect Killer cannot be assessed via a rapid pathway because it has a higher hazard classification than the potential reference substance: Mortein Powergard All in One Insect Killer has the classifications 6.4A, 6.5B and 9.4B that RB-2-143 does not have.



## Active ingredient

2.6 To allow evaluation of Mortein Powergard All in One Insect Killer, key aspects of imiprothrin, bioallethrin and permethrin regulation have been summarised below.

### Regulatory status

**Table 1: Active ingredients regulatory status**

Active ingredient name	Regulatory status and history in New Zealand	International regulatory status and history (Australia, Canada, Europe, Japan, USA)
Imiprothrin	Present in several HSNO-approved substances but no individual approval.	Approved in Australia, Europe, Canada and the USA for use in insecticides.
Bioallethrin	Present in several HSNO-approved substances. Approval number HSR005185.	Approved in Australia, Japan, and the USA for use in insecticides. Under review in Europe.
Permethrin	Present in several HSNO-approved substances. Approval number HSR003111.  Currently included in grounds for reassessment of synthetic pyrethroids	Approved in Australia, Europe, Japan, Canada and the USA.

- 2.7 Imiprothrin, bioallethrin and permethrin have previously been approved in New Zealand for use as active ingredients in insecticides and are available for both professional and non-professional users. They are approved internationally in jurisdictions such as Europe, the USA, Canada, Japan and Australia.
- 2.8 Bioallethrin and permethrin were included in the Hazardous Substances (Chemicals) Transfer Notice 2006.
- 2.9 Imiprothrin, bioallethrin and permethrin are on the Screened Chemicals List, and permethrin is one of 11 synthetic pyrethroids for which grounds for reassessment have been determined (APP203683). Any substances containing permethrin may be impacted by any subsequent reassessment of permethrin.
- 2.10 The formulation of Mortein Powergard All in One Insect Killer is considered confidential by the applicant.

### Regulatory parameters of active ingredient(s)

#### *Impurities and or restrictions on purity or composition*

2.11 No impurity limits for the active ingredients have been identified by FAO / APVMA.

*Concentration and maximum application rate*

- 2.12 Substances containing imiprothrin, bioallethrin or permethrin individually at similar or higher concentrations than in Mortein Powergard All in One Insect Killer have been approved. These approved substances are also intended for home use.
- 2.13 It is not considered appropriate to apply a maximum application rate to Mortein Powergard All in One Insect Killer as application is by spot treatment and not wide dispersive.

**Physical form and use pattern**

- 2.14 Mortein Powergard All in One Insect Killer is formulated as an aerosol.
- 2.15 The intended use of Mortein Powergard All in One Insect Killer is as an insecticide on flying and crawling insects in the home. The use pattern is summarised in Table 2 and the full outline of intended uses, application methods and application rates are detailed in the GAP table, Table 3.
- 2.16 The intended use pattern is similar to those already permitted under other approvals.

**Table 2: Summary of use pattern for Mortein Powergard All in One Insect Killer**

Substance category	Wide dispersive use?	Home use?	Concentration	Application rate(s)	Remarks
Insecticide	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	0.2 g/kg imiprothrin 1.2 g/kg bioallethrin 0.5 g/kg permethrin	Spray rate 3.0 – 4.0 g/s (25°C)	Direct spray onto insects



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**Table 3: GAP Table for Mortein Powergard All in One Insect Killer**

User (a)	Area of Use (b)	Pest or group of pests controlled (c)	Application			Application rate per treatment (f)	Remarks (g)
			Method (d)	Number min max (e)	Interval between applications - days (minimum)		
Non- professional	Domestic	Flying and crawling insects	Low volume	Not specified	Product is intended for direct spray for fast kill of flying and crawling insects.	Spray rate 3.0 – 4.0 g/s (25°C)	Direct spray onto insects

- Remarks**
- (a) Professional or non-professional
  - (b) Domestic/commercial/industrial
  - (c) e.g. biting and sucking insects, soil-borne insects, foliar fungi, weeds
  - (d) Method, e.g. high volume spraying, low volume spraying, spreading, dusting, drench
  - (e) The minimum and maximum number of application possible under practical conditions of use must be provided
  - (f) g/kg and g/l or others
  - (g) Remarks may include extent of use, economic importance and restrictions

### 3. Hazard Assessment

#### Hazard classification of Mortein Powergard All in One Insect Killer

- 3.1 The hazard classifications of Mortein Powergard All in One Insect Killer determined by the EPA are: 2.1.2A, 6.3B, 6.4A, 6.5B, 9.1A and 9.4B. Table 4 shows the method used for classification and indicates the main components that contribute to each hazard classification.
- 3.2 The EPA classification of Mortein Powergard All in One Insect Killer differed from that of the applicant in that the applicant classified the substance as 6.3A and the EPA classified it as 6.3B. This is because the applicant based their classifications on those identified for Mortein Powergard All in One Insect Killer in the section 26 formal determination application APP204017. After the decision for APP204017 was made, the hazard classifications for a component of the substance were updated as part of a modified reassessment. This change resulted in Mortein Powergard All in One Insect Killer's hazard classification for skin irritancy being downgraded from 6.3A to 6.3B.

**Table 4: Hazard classification of Mortein Powergard All in One Insect Killer**

Hazard Class/Subclass	Mixture classification		Method of classification			Remarks
	Applicant's classification	EPA classification	Mixture data	Read across	Mixture rules <sup>1</sup>	
Class 1 Explosiveness	No	ND	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Class 2, 3 & 4 Flammability	2.1.2A	2.1.2A	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Propellant
Class 5 Oxidisers/Organic Peroxides	No	ND	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
8.1 Metallic corrosiveness	No	ND	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
6.1 Acute toxicity (oral)	No	NA	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Aerosol
6.1 Acute toxicity (dermal)	No	ND	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
6.1 Acute toxicity (inhalation)	No	ND	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
6.1 Aspiration hazard	No	NA	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Aerosol
6.3/8.2 Skin irritancy/corrosion	<b>6.3A</b>	<b>6.3B</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Components G and J
6.4/8.3 Eye irritancy/corrosion	6.4A	6.4A	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Component D
6.5A Respiratory sensitisation	No	ND	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
6.5B Contact sensitisation	6.5B	6.5B	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Imiprothrin

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Hazard Class/Subclass	Mixture classification		Method of classification			Remarks
	Applicant's classification	EPA classification	Mixture data	Read across	Mixture rules <sup>1</sup>	
6.6 Mutagenicity	No	ND	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
6.7 Carcinogenicity	No	ND	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
6.8 Reproductive/ developmental toxicity	No	ND	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
6.8 Reproductive/ developmental toxicity (via lactation)	No	ND	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
6.9 Target organ systemic toxicity	No	ND	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
9.1 Aquatic ecotoxicity	9.1A	9.1A	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Imiprothrin, bioallethrin, permethrin, component D
9.2 Soil ecotoxicity	No	ND	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
9.3 Terrestrial vertebrate ecotoxicity	No	NA	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Aerosol
9.4 Terrestrial invertebrate ecotoxicity	9.4B	9.4B	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Imiprothrin, bioallethrin, permethrin

-: No information provided by the applicant

**NA:** Not Applicable. For instance, testing for a specific endpoint may be omitted if it is technically not possible to conduct the study as a consequence of the properties of the substance e.g. highly volatile, highly reactive or unstable substances cannot be tested; mixing of the substance with water may cause danger of fire or explosion; or the radio-labelling of the substance required in certain studies may not be possible.

**ND:** Not Determined. Data were unavailable for one or more components.

**No:** Data are available for the formulation or for all components and classification is not triggered.

<sup>1</sup> Use of mixture rules may not adequately take into account interactions between different components in some circumstances and must be considered of lower reliability than data on the mixture itself.

<sup>2</sup> Klimisch, H-J., Andrear, M., & U. Tillmann, 1997. A systematic approach for evaluating the quality of experimental toxicological and ecotoxicological data. Reg. Toxicol. Pharmacol. 25, 1-5 (1997)

## Adverse effects

- 3.3 Permethrin is associated with paraesthesia (a sensation of pricking, tingling, numbness or burning in the skin), which poses an additional risk over and above those summarised by the hazard classifications of the substance.

## 4. Risk Assessment

- 4.1 It is considered that there is potential for significant exposure to people during the use phase of the lifecycle. Therefore, a qualitative risk assessment was undertaken to understand the likely exposures to the substance under the use conditions proposed by the applicant.
- 4.2 During the importation, manufacture, transportation, storage and disposal of this substance it is considered that the proposed controls and other legislative requirements will sufficiently mitigate risks to a negligible level.
- 4.3 This assessment takes into account the existing EPA Notices controls around packaging, identification and disposal of hazardous substances. In addition, the Land Transport Rule 45001, Civil Aviation Act 1990, Maritime Transport Act 1994 and New Zealand's Health and Safety at Work (Hazardous Substances) (HSW (HS)) requirements all have provisions for the safe management of hazardous substances.

### Physical hazard risk assessment

- 4.4 Mortein Powergard All in One Insect Killer is a flammable aerosol and could cause damage in the instance of a spill or leak of the substance in presence of an ignition source. The magnitude of this effect would be **moderate**. The prescribed controls under HSW (HS) regulations and other relevant legislation specifically address risks associated with the flammability of this substance during storage, transport, use, disposal and in the event of an emergency. Therefore, the likelihood of an event of this nature of occurring during the life cycle of this substance would be **highly improbable**. Accordingly, the level of residual risk from the physical hazards of Mortein Powergard All in One Insect Killer is **negligible**, provided that the prescribed controls are in place and complied with.

### Human health risk assessment

- 4.5 Mortein Powergard All in One Insect Killer is intended to be supplied to the domestic market. It is purchased in a ready-to-use form that is packaged in an aerosol can with spray nozzle. Users are expected to spray the substance from the aerosol can directly onto the target insect, and there is no mixing or loading required. It is **likely** that users will be exposed to the substance during application. Risks during other phases of the lifecycle are mitigated by the prescribed controls.
- 4.6 Mortein Powergard All in One Insect Killer is classified as 6.3B, 6.4A and 6.5B, so has the potential to cause skin and eye irritation and to cause skin sensitisation. Long-term skin sensitisation effects



require multiple exposures over a period of time and are considered **improbable**, while skin irritation is expected to be minor and reversible. The substance label should state that humans, pets, clothing, bedding and surfaces in contact with food should not be sprayed. Based on the prescribed and additional controls, the risk from skin irritation and sensitisation are assessed as **negligible**.

- 4.7 An additional control to address the issue of paraesthesia (a temporary burning, itching, tingling and numbness most common in the face, occurring one to two hours after the beginning of exposure and resolving spontaneously) caused by pyrethroids, such as permethrin, is proposed for Powergard All in One Insect Killer. The label of Mortein Powergard All in One Insect Killer should include a warning statement about the potential for permethrin to cause paraesthesia, as required by clause 15 of the Hazardous Substances (Labelling) Notice 2017.
- 4.8 Eye irritation is **unlikely**, as this would involve either spraying directly at the eyes or getting substance on the hands then rubbing the eyes. Any effect is expected to be **moderate** and reversible. As such, the risk from the eye irritancy hazard is assessed as **negligible**.

## Environmental risk assessment

- 4.9 Mortein Powergard All in One Insect Killer is an insecticide designed for use on insects within the home. It has the potential to affect aquatic organisms and terrestrial invertebrates if significant exposure occurs.

### Aquatic ecotoxicity (9.1A)

- 4.10 It is **very unlikely** that aquatic organisms will be exposed to Mortein Powergard All in One Insect Killer, as application is intended to be inside the home. However, exposure could occur due to an accident during transport or storage, or from spray drift if used outside.
- 4.11 Mortein Powergard All in One Insect Killer is classified as highly ecotoxic to aquatic organisms (fish and crustaceans) and as such, it is expected that exposure may result in **major** effects to organisms. The prescribed controls do not fully mitigate this risk. The classification of Mortein Powergard All in One Insect Killer triggers prescribed controls that prohibit the application of the substance directly into or onto water. The label of the substance should also state that the spray should not be allowed into or onto aquarium water. These controls mitigate the risks to aquatic organisms to a **negligible** level.

### Toxicity to terrestrial invertebrates (9.4B)

- 4.12 It is **highly likely** that terrestrial invertebrates will be exposed during the use of Mortein Powergard All in One Insect Killer, as crawling and flying insects in the home are the intended targets. However, non-target terrestrial invertebrates such as bees are **unlikely** to be exposed based on the intended, targeted, use pattern.
- 4.13 Synthetic pyrethroids are highly toxic to honey bees. However, Mortein Powergard All in One Insect Killer will not be used in a dispersive manner and is not intended for use on plants, where bees and other beneficial insects are likely to be found. An additional control is proposed to restrict the

substance's use to indoor situations only. With its intended use pattern and the prescribed and additional controls in place, the risks to terrestrial invertebrates from the use of Mortein Powergard All in One Insect Killer will be **negligible**.

## Risk assessment conclusion

- 4.14 Risks during other phases of the lifecycle are also mitigated by the prescribed controls.
- 4.15 With the proposed controls in place, the residual risks of the use of Mortein Powergard All in One Insect Killer are negligible.

## 5. Controls

### Prescribed controls (EPA Notice controls)

- 5.1 The hazard classifications of Mortein Powergard All in One Insect Killer determine a set of prescribed controls specified by the EPA Notices. There are also requirements in the Health and Safety at Work (Hazardous Substance, HSW (HS)) Regulations under the HSW Act.
- 5.2 The prescribed controls set the baseline for how the substance should be managed and include specifications on how the substance is to be packaged, labelled, stored, disposed of, transported, handled and used. The prescribed controls also set information requirements (e.g. Safety Data Sheets), signage and emergency management.

### Exposure limits

- 5.3 No Tolerable Exposure Limits (TELs) have been set previously for the active ingredients in Mortein Powergard All in One Insect Killer because it is considered that exposure to this substance is not likely to result in an appreciable toxic effect to people, provided conditions of use are followed.
- 5.4 No Environmental Exposure Limit (EEL) values have been set previously for the active ingredient in Mortein Powergard All in One Insect Killer because previous quantitative risk assessments have shown that this substance is not likely to result in an appreciable toxic effect to the environment, provided conditions of use are followed.

### Labelling and identification

- 5.5 The name and concentration of the following components need to be specified on the label and SDS:

**Table 6: List of components requiring identification**

Label	SDS
Imiprothrin	Quaternary ammonium compounds, benzyl-C12-18-alkyldimethyl, salts with 1,2-benzisothiazol-3(2H)-one 1,1-dioxide (1:1) Imiprothrin Bioallethrin

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Permethrin
Butane (WES)
Propane (WES)
Ethanol (WES)
Butylated hydroxytoluene (WES)

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## Variations to prescribed controls

### Labelling

5.6 The label must include a warning statement about the potential for permethrin to cause paraesthesia and how to avoid it. This requirement could be met by a labelling statement such as:

- *“Facial skin contact may cause temporary numbness.”*

5.7 In order to mitigate risks associated with the use of Mortein Powergard All in One Insect Killer, the following information, or words to the same effect, must be included on the label:

- *“Do not spray directly onto humans, pets, food, food preparation surfaces or food utensils. Additionally, any food utensils or food preparation surfaces should be thoroughly cleaned before reuse.”*
- *“Do not apply to clothing or human bedding.”*
- *“Do not touch treated surfaces until dry.”*

5.8 To mitigate risks associated with the 9.1A hazard classifications, the following information, or words to the same effect, must be included on the label:

- *“Do not allow spray to get into or onto aquarium water.”*

5.9 To ensure that Mortein Powergard All in One Insect Killer is used in indoor situations only, the following information, or words to the same effect, must be included on the label:

- *“For indoor use only.”*

## Additional controls

### Use

5.10 It is appropriate to place a restriction to ensure that Mortein Powergard All in One Insect Killer is only used in indoor situations.

## 6. Conclusion

6.1 After taking into account the prescribed controls and any proposed additions to these controls, it was concluded that the residual level of risk of any potentially significant adverse effects is negligible.