



# SAFETY DATA SHEET

## Rombus Trio

Revision: Sections containing a revision or new information are marked with a ♣.

1.1. **Product identifier .....** **Rombus Trio**  
**Contains tebuconazole, triadimenol and gamma-butyrolactone**

1.2. Relevant identified uses of the substance or mixture and uses advised against .....	Can be used as fungicide only.
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1.3. **Details of the supplier of the safety data sheet**

**FMC Agricultural Solutions A/S**  
Thyborønvej 78  
DK-7673 Harboøre  
Denmark  
[SDS.Ronland@fmc.com](mailto:SDS.Ronland@fmc.com)

#### 1.4. Emergency telephone number

*Medical emergencies:*

Austria: +43 1 406 43 43  
Belgium: +32 70 245 245  
Bulgaria: +359 2 9154 409  
Cyprus: 1401  
Czech Republic: +420 224 919 293  
+420 224 915 402  
Denmark: +45 82 12 12 12  
England and Wales: 111  
Estonia: +372 7943500  
France: +33 (0) 1 45 42 59 59  
Finland: +358 9 471 977  
Greece: 30 210 77 93 777  
Hungary: +36 80 20 11 99  
Ireland (Republic): +353 1 837 9964  
Italy: +39 02 6610 1029  
Latvia: +371 670 42 473  
112  
Lithuania: +370 523 62052  
+370 687 53378  
Luxembourg: +352 8002 5500

Malta: 112  
Netherlands: +31 30 274 88 88  
Norway: +47 22 591300  
Poland: +48 22 619 66 54  
          +48 22 619 08 97  
Portugal: 800 250 250 (in Portugal only)  
          +351 21 330 3284  
Romania: +40 21318 3606  
Scotland: +8454 24 24 24  
Slovakia: +421 2 54 77 4 166  
Slovenia: +386 41 650 500  
South Africa: +27 83 123 3911 (Bateleur Emergency Response Co.)  
Spain: +34 91 562 04 20  
Sweden: +46 08-331231  
          112  
Switzerland: 145  
Turkey: 114  
U.S.A. & Canada: +1 800 / 331 3148  
All other countries: +1 651 / 632 6793 (Collect)

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For fire, leak, spill or other accident emergencies:

U.S.A.: +1 800 / 424 9300 (CHEMTREC)  
 All other countries: +1 703 / 741 5970 (CHEMTREC - Collect)

**♣ SECTION 2: HAZARDS IDENTIFICATION**

**2.1. Classification of the substance or mixture**

Acute oral toxicity: Category 4 (H302)  
 Acute inhalation toxicity: Category 4 (H332)  
 Skin corrosion: Category 1B (H314)  
 Eye damage: Category 1 (H318)  
 Toxic to reproduction: Category 1B (H360Fd)  
 Effects on or via lactation (H362)  
 Specific target organ toxicity – single exposure: Category 3 (H335)  
 Specific target organ toxicity – repeated exposure: Category 2 (H373)  
 Hazards to the aquatic environment, acute: Category 1 (H400)  
 chronic: Category 1 (H410)

WHO classification ..... Class II: Moderately hazardous

Health hazards ..... The product is harmful by single exposures and has seriously irritating properties. It may damage fertility and the unborn child. It may harm the newly born child through breastfeeding. Other harmful effects are possible in case repeated exposure. See section 11.

Environmental hazards ..... The product is very toxic to aquatic organisms.

**2.2. Label elements**

According to EU Reg. 1272/2008 as amended

Product identifier ..... Rombus Trio  
 Contains tebuconazole, triadimenol and gamma-butyrolactone

Hazard pictograms (GHS05, GHS07, GHS08, GHS09)



Signal word ..... Danger

**Hazard statements**

H302 ..... Harmful if swallowed.  
 H314 ..... Causes severe skin burns and eye damage.  
 H332 ..... Harmful if inhaled.  
 H335 ..... May cause respiratory irritation.  
 H360Fd ..... May damage fertility and suspected of damaging the unborn child.  
 H362 ..... May cause harm to the breast-fed child.  
 H373 ..... May cause damage to the eyes through prolonged or repeated exposure.  
 H410 ..... Very toxic to aquatic life with long lasting effects.

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Supplementary hazard statements	
EUH208 .....	Contains spiroxamine. May produce an allergic reaction.
EUH401 .....	To avoid risks to human health and the environment, comply with the instructions of use.
Precautionary statements	
P261 .....	Avoid breathing vapours.
P280 .....	Wear protective gloves, protective clothing and eye or face protection.
P303+P361+P353 .....	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P305+P351+P338 .....	IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310 .....	Immediately call a POISON CENTER or physician.
P501 .....	Dispose of contents and container as hazardous waste.
2.3. Other hazards .....	None of the ingredients in the product meets the criteria for being PBT or vPvB.

### ♣ SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1. Substances .....	The product is a mixture, not a substance.
3.2. Mixtures .....	See section 16 for full text of hazard statements.
<u>Active ingredients</u>	
<b>Spiroxamine</b> .....	Content: 25% by weight
CAS name .....	1,4-Dioxaspiro[4,5]decane-2-methylamine, 8-(1,1-dimethylethyl)-N-ethyl-N-propyl- (9CI)
CAS no. ....	118134-30-8
Chemical name .....	8-tert-Butyl-1,4-dioxaspiro[4,5]dec-2-ylmethyl(ethyl)(propyl)amine
ISO name/EU name .....	Spiroxamine
EC no. (EINECS no.) .....	None
EU index no. ....	612-150-00-X
Molecular weight .....	297.47
Classification of the ingredient .....	Acute oral toxicity: Category 4 (H302) Acute dermal toxicity: Category 4 (H312) Acute inhalation toxicity: Category 4 (H332) Skin irritation: Category 2 (H315) Skin sensitisation: Category 1 (H317) Specific target organ toxicity – repeated exposure: Category 2 (H373) Toxic to reproduction: Category 2 (H361d) Hazards to the aquatic environment, acute: Category 1 (H400), M-factor 100 chronic: Category 1 (H410), M-factor 100
<b>Tebuconazole</b> .....	Content: 17% by weight
CAS name .....	1H-1,2,4-Triazole-1-ethanol, $\alpha$ -[2-(4-chlorophenyl)ethyl]- $\alpha$ -(1,1-dimethylethyl)-
CAS no. ....	107534-96-3
IUPAC name .....	(RS)-1-p-Chlorophenyl-4,4-dimethyl-3-(1H-1,2,4-triazol-1-ylmethyl)pentan-3-ol

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ISO name/EU name ..... Tebuconazole  
EC no. (ELINCS no.) ..... 403-640-2  
EU index no. .... 603-197-00-7  
Molecular weight ..... 307.82  
Classification of the ingredient ..... Acute oral toxicity: Category 4 (H302)  
Toxic to reproduction: Category 2 (H361d)  
Hazards to the aquatic environment,  
acute: Category 1 (H400), M-factor 100  
chronic: Category 1 (H410), M-factor 100

**Triadimenol** ..... Content: 4% by weight  
CAS name ..... 1H-1,2,4-Triazole-1-ethanol,  $\beta$ -(4-chlorophenoxy)- $\alpha$ -(1,1-dimethyl-ethyl)-  
CAS no. .... 55219-65-3  
IUPAC name ..... 1-(4-Chlorophenoxy)-3,3-dimethyl-1-[1H-1,2,4]triazol-1-yl-butan-2-ol  
ISO name/EU name ..... Triadimenol  
EC no. (EINECS no.) ..... 259-537-6  
EU index no. .... 613-322-00-7  
Molecular weight ..... 295.76  
Classification of the ingredient ..... Acute oral toxicity: Category 4 (H302)  
Reproduction toxicity: Category 1B (H360F)  
Effects on or via lactation (H362)  
Hazards to the aquatic environment, chronic: Category 2 (H411)

<u>Reportable ingredients</u>	Content (% w/w)	CAS no.	EC no. (EINECS no.)	Classification
Arylethylphenylpolyglykoether	1 - 25	104376-75-2	None	Aquatic Chronic 3 (H412)
N,N-Dimethyldecan-1-amide Reg. no. 01-2119485027-36	> 20	14433-76-2	238-405-1	Skin Irrit. 2 (H315) Eye Irrit. 2 (H319) STOT SE 3 (H335) Aquatic Chronic 3 (H412)
$\gamma$ -Butyrolactone Reg. no. 01-2119471839-21	1 - 15	96-48-0	202-509-5	Acute Tox. 4 (H302) Eye Dam. 1 (H318) STOT SE 3 (H336)

#### ♣ SECTION 4: FIRST AID MEASURES

##### 4.1. Description of first aid measures

Inhalation ..... If experiencing any discomfort, immediately remove from exposure. Light cases: Keep person under surveillance. Get medical attention immediately if symptoms develop. Serious cases: Get medical attention immediately or call for an ambulance.

Skin contact ..... Immediately remove contaminated clothing and footwear and dispose of safely. Flush skin with much water. Wash with water and soap. See physician if irritation persists.

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- Eye contact ..... Immediately rinse eyes with much water or eyewash solution, occasionally opening eyelids, until no evidence of chemical remains. Remove contact lenses after a few minutes and rinse again. Get medical attention immediately.
- Ingestion ..... Let the exposed person rinse mouth and drink several glasses of water or milk, but not induce vomiting. If vomiting does occur, let him/her rinse mouth and drink several glasses of fluid again. Get medical attention immediately.
- 4.2. **Most important symptoms and effects, both acute and delayed ..** Primarily irritation.
- 4.3. **Indication of any immediate medical attention and special treatment needed**
- Immediate medical attention is required in case of ingestion.
- It may be helpful to show this safety data sheet to physician.
- A specific antidote for exposure to this material is not known. If swallowed, gastric lavage and/or administration of activated charcoal can be considered. After decontamination, treatment of exposure is as for a general chemical and should be directed at the control of symptoms and the clinical condition.

#### ♣ SECTION 5: FIRE-FIGHTING MEASURES

- 5.1. **Extinguishing media** ..... Dry chemical or carbon dioxide for small fires, water spray or foam for large fires. Avoid heavy hose streams.
- 5.2. **Special hazards arising from the substance or mixture** The essential breakdown products are volatile, toxic, malodorous, irritant and inflammable compounds such as nitrogen oxides, carbon monoxide, carbon dioxide, hydrogen chloride and various chlorinated organic compounds.
- 5.3. **Advice for firefighters** ..... Use water spray to keep fire-exposed containers cool. Approach fire from upwind to avoid hazardous vapours and toxic decomposition products. Fight fire from protected location or maximum possible distance. Dike area to prevent water runoff. Firemen should wear self-contained breathing apparatus and protective clothing.

#### ♣ SECTION 6: ACCIDENTAL RELEASE MEASURES

- 6.1. **Personal precautions, protective equipment and emergency procedures**
- It is recommended to have a predetermined plan for the handling of spills. Empty, sealable vessels for the collection of spills should be available.
- In case of large spill (involving 1 tonne of the product or more):
1. use personal protection equipment; see section 8
  2. call emergency telephone no.; see section 1
  3. alert authorities.

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Observe all safety precautions when cleaning up spills. Use personal protection equipment. Depending on the magnitude of the spill this may mean wearing respirator, face mask or eye protection, chemical resistant clothing, gloves and boots.

Stop the source of the spill immediately if safe to do so. Spills should be removed as soon as possible. Avoid and reduce vapour and mist formation as much as possible. Remove sources of ignition. Keep unprotected persons away from the spill area.

**6.2. Environmental precautions .....**

Contain the spill to prevent any further contamination of surface, soil or water. Wash waters must be prevented from entering surface water drains. Uncontrolled discharge into water courses must be alerted to the appropriate regulatory body.

**6.3. Methods and materials for containment and cleaning up**

It is recommended to consider possibilities to prevent damaging effects of spills, such as bunding or capping. See GHS (Annex 4, Section 6).

If appropriate, surface water drains should be covered. Minor spills on the floor or other impervious surface should be absorbed onto an absorptive material such as universal binder, hydrated lime, Fuller's earth or other absorbent clays. Collect the contaminated absorbent in suitable containers. Clean area with much water and industrial detergent. Absorb wash liquid onto an absorptive material and collect in suitable containers. The used containers should be properly closed and labelled.

Large spills which soak into the ground should be dug up and transferred to suitable containers.

Spills in water should be contained as much as possible by isolation of the contaminated water. The contaminated water must be collected and removed for treatment or disposal.

**6.4. Reference to other sections .....**

See subsection 8.2. for personal protection.  
 See section 13 for disposal.

**♣ SECTION 7: HANDLING AND STORAGE**

**7.1. Precautions for safe handling ....**

Persons working with this material for a longer period should be careful to minimise exposure. See section 11. Pregnant or breastfeeding women must avoid working with the product altogether, because it may have an effect on the unborn or newly born child.

In an industrial environment it is recommended to avoid all personal contact with the product, if possible by using closed systems with remote system control. The material should be handled by mechanical means as much as possible. Adequate ventilation or local exhaust

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ventilation is required. The exhaust gases should be filtered or treated otherwise. For personal protection in this situation, see section 8.

For its use as a pesticide, first look for precautions and personal protection measures on the officially approved label on the packaging or for other official guidance or policy in force. If these are lacking, see section 8.

Keep all unprotected persons and children away from working area.

Remove contaminated clothing immediately. Wash thoroughly after handling. Before removing gloves, wash them with water and soap. After work, take off all work clothes and footwear. Take a shower, using water and soap. Wear only clean clothes when leaving job. Wash protective clothing and protective equipment with water and soap after each use.

Do not discharge to the environment. Do not contaminate water when disposing of equipment wash waters. Collect all waste material and remains from cleaning equipment, etc., and dispose of as hazardous waste. See section 13 for disposal.

**7.2. Conditions for safe storage, including any incompatibilities**

The product is stable under normal conditions of warehouse storage. Protect from direct sunlight and frost.

Store in closed, labelled containers. The storage room should be constructed of incombustible material, closed, dry, ventilated and with impermeable floor, without access of unauthorised persons or children. A warning sign reading “POISON” is recommended. The room should only be used for storage of chemicals. Food, drink, feed and seed should not be present. A hand wash station should be available.

**7.3. Specific end use(s) .....**

The product is a registered pesticide which may only be used for the applications it is registered for, in accordance with a label approved by the regulatory authorities.

**♣ SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION**

**8.1. Control parameters**

Personal exposure limits .....

To our knowledge, not established for the active ingredients in this product.

However, personal exposure limits defined by local regulations may exist and must be observed.

**Spiroxamine**

DNEL .....

Not established

PNEC, aquatic environment .....

The EFSA has established an AOEL of 0.015 mg/kg bw/day  
 3.4 µg/l

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#### **Tebuconazole**

DNEL ..... Not established  
 The EFSA has established an AOEL of 0.03 mg/kg bw/day  
 PNEC, aquatic environment ..... 1 µg/l

#### **Triadimenol**

DNEL ..... Not established  
 The EFSA has established an AOEL of 0.05 mg/kg bw/day  
 PNEC, aquatic environment ..... 3 µg/l

#### **N,N-Dimethyldecan-1-amide**

DNEL, inhalation, workers ..... 166.67 mg/m<sup>3</sup>  
 DNEL, dermal, workers ..... 23.81 mg/kg bw/day  
 PNEC, fresh water ..... 0.028 mg/l  
 PNEC, marine water ..... 0.003 mg/l

#### **γ-Butyrolactone**

DNEL, dermal ..... 19 mg/kg bw/day  
 DNEL, inhalation ..... 130 mg/m<sup>3</sup>  
 PNEC, aquatic environment ..... 0.056 mg/l

### **8.2. Exposure controls**

When used in a closed system, personal protection equipment will not be required. The following is meant for other situations, when the use of a closed system is not possible, or when it is necessary to open the system. Consider the need to render equipment or piping systems non-hazardous before opening.

The precautions mentioned below are primarily meant for handling of the undiluted product and for preparing the spray solution, but can be recommended for spraying as well.

In cases of incidental high exposure, maximal personal protection may be necessary, such as respirator, face mask, chemical resistant coveralls.



Respiratory protection

In the event of a discharge of the material which produces a heavy vapour or mist, workers should put on officially approved respiratory protection equipment with a universal filter type including particle filter.



Protective gloves .....

Wear long chemical resistant gloves, such as barrier laminate, butyl rubber or nitrile rubber. The breakthrough times of these materials for epoxiconazole are unknown. Generally, however, the use of protective gloves will give only partial protection against dermal exposure. Small tears in the gloves and cross-contamination can easily occur. It is recommended to limit the work to be done manually and to change the gloves frequently. Be careful not to touch anything with contaminated gloves. Used gloves should be thrown out and not be reused. Dispose



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of safely Wash hands with water and soap immediately after work is finished.



Eye protection .....

Wear safety glasses or face shield. It is recommended to have an eye wash fountain immediately available in the workplace when there is a potential for eye contact.



Other skin protection

Wear appropriate chemical resistant clothing to prevent skin contact depending on the extent of exposure. During most normal work situations where exposure to the material cannot be avoided for a limited time span, waterproof pants and apron of chemical resistant material or coveralls of polyethylene (PE) will be sufficient. Coveralls of PE must be discarded after use if contaminated. In cases of excessive or prolonged exposure, coveralls of barrier laminate may be required.

## ♣ SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

### 9.1. Information on basic physical and chemical properties

Physical state .....	Liquid
Colour .....	Light brown
Odour .....	Aromatic
Melting point/freezing point .....	Not determined
Boiling point or initial boiling point and boiling range .....	Not determined
Flammability .....	Ignitable
Lower and upper explosive limit ..	<b>γ-Butyrolactone</b> : 2.7 - 17.5 vol% (≈ 2.7 - 17.5 kPa)
Flash point .....	110°C
Auto-ignition temperature .....	315°C
Decomposition temperature .....	Not determined
pH .....	1% dilution in water: 7.0 – 9.0
Kinematic viscosity .....	35 mm <sup>2</sup> /s at 20°C at shear rate 100/s 15 mm <sup>2</sup> /s at 40°C at shear rate 100/s
Solubility .....	The product can be emulsified in water. Solubility of <b>spiroxamine</b> in: ethyl acetate > 200 g/l at 20°C n-hexane > 200 g/l at 20°C water 340 - 470 mg/l at pH 7 10 - 14 mg/l at pH 9 Solubility of <b>tebuconazole</b> in: ethyl acetate > 250 g/l n-heptane 0.69 g/l at 20°C water 32 mg/l at 20°C Solubility of <b>triadimenol</b> in water at 20°C and pH 7: 72 mg/l
Partition coefficient n-octanol/water (log value)	<b>Spiroxamine</b> : log K <sub>ow</sub> = 2.8 – 3.0 at 20°C and pH 7 <b>Tebuconazole</b> : log K <sub>ow</sub> = 3.7 at 20°C (unionised) <b>Triadimenol</b> : log K <sub>ow</sub> = 3.18 at 25°C

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Vapour pressure .....	<b>N,N-Dimethyldecan-1-amide</b> : log $K_{ow}$ = 3.44 at 20°C <b>γ-Butyrolactone</b> : log $K_{ow}$ = -0.57 at 25°C <b>Spiroxamine</b> : 3 - 6 x 10 <sup>-3</sup> Pa at 20°C 6 - 10 x 10 <sup>-3</sup> Pa at 25°C <b>Tebuconazole</b> : 1.3 x 10 <sup>-6</sup> Pa at 20°C 3.1 x 10 <sup>-6</sup> Pa at 25°C <b>Triadimenol</b> : 5 x 10 <sup>-7</sup> Pa at 20°C <b>N,N-Dimethyldecan-1-amide</b> : 1.1 x 10 <sup>-1</sup> Pa at 25°C <b>γ-Butyrolactone</b> : 40 Pa at 20°C
Density and/or relative density .....	Density: approx. 0.99 g/ml
Relative vapour density .....	Not determined
Particle characteristics .....	Not applicable (liquid)

9.2. **Other information** ..... No more relevant information is available.

#### ♣ SECTION 10: STABILITY AND REACTIVITY

10.1. <b>Reactivity</b> .....	To our knowledge, the product has no special reactivities.
10.2. <b>Chemical stability</b> .....	The product is stable during normal handling and storage at ambient temperatures.
10.3. <b>Possibility of hazardous reactions</b>	None known.
10.4. <b>Conditions to avoid</b> .....	Heating of the product will produce harmful and irritant vapours.
10.5. <b>Incompatible materials</b> .....	None known.
10.6. <b>Hazardous decomposition products</b>	See subsection 5.2.

#### ♣ SECTION 11: TOXICOLOGICAL INFORMATION

11.1. <b>Information on hazard classes as defined in Regulation (EC) No 1272/2008</b>	* = Based on available data, the classification criteria are not met.	
<u>Product</u>		
Acute toxicity .....	The product is harmful by ingestion and inhalation. The acute toxicity, as measured on a similar product, is:	
Route(s) of entry	- ingestion	LD <sub>50</sub> , oral, rat: 500 - 1000 mg/kg
	- skin	LD <sub>50</sub> , dermal, rat: > 2000 mg/kg
	- inhalation	LC <sub>50</sub> , inhalation, rat: 1.5 mg/l/4 h (Acute Toxicity Estimate)
Skin corrosion/irritation .....	Measured on a similar product: corrosive.	
Serious eye damage/irritation .....	Measured on a similar product: seriously irritating to eyes.	
Respiratory or skin sensitisation ...	Measured on a similar product: not sensitising (method OECD 406). *	

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Germ cell mutagenicity .....	The product contains no ingredients known to be mutagenic. *
Carcinogenicity .....	The product contains no ingredients known to be carcinogenic. *
Reproductive toxicity .....	<p><b>Spiroxamine</b> showed reproductive toxicity in two-generation studies in rats only at doses that were toxic to parents only (methods OECD 414 and 416). The reproductive toxicity observed with spiroxamine is related to general toxicity.</p> <p>Adverse effects on fertility such as reduced litter size and effects on development were found for <b>tebuconazole</b> at maternally toxic doses in an animal test (method OECD 416). Malformations of offspring were found at maternally toxic doses (based on 13 studies).</p> <p>For <b>triadimenol</b>, adverse effects on fertility and decreased post-natal survival were found. Effects on development of offspring was found at doses which induced maternal toxicity as well. Triadimenol caused reduced lactation</p>
STOT – single exposure .....	On inhalation, the product may cause irritation of airways and may have effects on the central nervous system.
STOT – repeated exposure .....	<p>The following has been measured on <b>spiroxamine</b>:          Target organ: eye and liver          In a 2-year oral rat study (method OECD 453), irritation induced effects of mucosal epithelium of the eyes was observed. NOEL was determined to be 70 ppm (4.2 mg/kg bw/day).</p> <p>The following has been measured on <b>tebuconazole</b>:          Several effects were found in rats at LOEL 80 mg tebuconazole/kg bw/day for 13 weeks. Liver, adrenals, spleen and eyes were affected. *</p> <p>The following has been found for <b>triadimenol</b>:          Target organ: liver, kidneys and ovaries          NOAEL: 120 ppm (8 - 9 mg/kg bw/day) in a 90-day rat study. At this exposure level, slight anaemia and variations in organ weights were observed.</p>
Aspiration hazard .....	The product does not present an aspiration hazard. *
<u><i>Spiroxamine</i></u> Toxicokinetics, metabolism and distribution	After oral administration, spiroxamine is readily absorbed, extensively metabolised and excreted almost completely within two days. It is widely distributed in the body, but primarily to liver, thymus and fatty tissue. There is no evidence of accumulation.
Acute toxicity .....	The substance is harmful by single exposure. The measured acute toxicity is:
Route(s) of entry      - ingestion	LD <sub>50</sub> , oral, rat: 374 mg/kg (method OECD 401)

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	- skin	LD <sub>50</sub> , dermal, rat: 1068 mg/kg (method OECD 402)
	- inhalation	LC <sub>50</sub> , inhalation, rat: 2.0 mg/l/4 h (method OECD 403)
Skin corrosion/irritation .....		Severely irritating to skin (method OECD 404).
Serious eye damage/irritation .....		Mildly irritating to eyes (method OECD 405). *
Respiratory or skin sensitisation ...		Sensitising (method OECD 406).
<u><b>Tebuconazole</b></u>		
Toxicokinetics, metabolism and distribution		Tebuconazole is almost completely absorbed, metabolised and excreted within a few days. It is widely distributed in the body. There is no evidence of accumulation.
Acute toxicity .....		The substance may be harmful by ingestion. It is not considered as harmful by skin contact or by inhalation.
Route(s) of entry	- ingestion	LD <sub>50</sub> , oral, rat (male): 4000 - > 5000 mg/kg (method OECD 401)
		LD <sub>50</sub> , oral, rat (female): 1700 - > 5000 mg/kg
	- skin	LD <sub>50</sub> , dermal, rat: > 2000 mg/kg (method OECD 402)
	- inhalation	LC <sub>50</sub> , inhalation, rat: > 5.093 mg/l/4 h (method OECD 403)
Skin corrosion/irritation .....		Not irritating to skin (method OECD 404). *
Serious eye damage/irritation .....		Mildly irritating to eyes (method FIFRA 81-4). *
Respiratory or skin sensitisation ...		Not sensitising (method OECD 406). *
<u><b>Triadimenol</b></u>		
Toxicokinetics, metabolism and distribution		After oral intake, triadimenol is rapidly absorbed and widely distributed in the body with highest concentrations found in fat, the urinary bladder and liver. It is extensively metabolised. It is excreted within a few days. Accumulation is not likely.
Acute toxicity .....		The substance is harmful by ingestion, but is not considered as harmful by inhalation and skin contact. The acute toxicity is measured as:
Route(s) of entry	- ingestion	LD <sub>50</sub> , oral, rat: 720 mg/kg
	- skin	LD <sub>50</sub> , dermal, rat: > 2000 mg/kg (method OECD 402) *
	- inhalation	LC <sub>50</sub> , inhalation, rat: > 0.95 mg/l/4 h *
Skin corrosion/irritation .....		Not irritating to skin (method OECD 404). *
Serious eye damage/irritation .....		Slightly irritating to eyes (method OECD 405). *
Respiratory or skin sensitisation ...		Not sensitising (method OECD 406). *

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The following has either been measured on a mixture of N,N-dimethyloctanamide and N,N-dimethyldecan-1-amide or on a mixture of these two compounds with other comparable N,N-dimethylalkanamides

Acute toxicity .....	The mixture is not considered as harmful by inhalation, ingestion or skin contact. * The acute toxicity is measured as:
Route(s) of entry	
- ingestion	LD <sub>50</sub> , oral, rat: > 2000 mg/kg (method OECD 401)
- skin	LD <sub>50</sub> , dermal, rat: > 2000 mg/kg (method OECD 402)
- inhalation	LC <sub>50</sub> , inhalation, rat: > 3.5 mg/l/4 h (method OECD 403)
Skin corrosion/irritation .....	Irritating to skin (method similar to OECD 404).
Serious eye damage/irritation .....	Severely irritating to eyes (method similar to OECD 405).
Respiratory or skin sensitisation ...	Not a skin sensitizer (method similar to OECD 406). *
STOT – single exposure .....	The product can be irritating to airways.

#### γ-Butyrolactone

Toxicokinetics, metabolism and distribution	γ-Butyrolactone is rapidly and completely absorbed and distributed primarily to plasma and liver. It is rapidly metabolised and eliminated primarily as respiratory carbon dioxide and urinary metabolites.
Acute toxicity .....	The substance is harmful by ingestion. It is not considered as harmful by inhalation or skin contact. The acute toxicity is measured as:
Route(s) of entry	
- ingestion	LD <sub>50</sub> , oral, rat: 1582 mg/kg
- skin	LD <sub>50</sub> , dermal, guinea pig: > 5000 mg/kg *
- inhalation	LC <sub>50</sub> , inhalation, rat: > 5.1 mg/l/4 h *
Skin corrosion/irritation .....	Not irritating to skin. *
Serious eye damage/irritation .....	Seriously irritating to eyes (method OECD 405).
Respiratory or skin sensitisation ...	Not sensitising to skin in animal tests. To our knowledge, allergenic effects have not been reported. *
STOT – single exposure .....	May have narcotic effects by inhalation.

11.2. **Information on other hazards ....** No more relevant information is available.

## ♣ SECTION 12: ECOLOGICAL INFORMATION

12.1. **Toxicity .....** The product is toxic to aquatic plants and harmful to fish and aquatic invertebrates. It is not considered as harmful to birds, soil micro- and macroorganisms, insects and mammals.

The ecotoxicity, as measured on a similar formulation, is:

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- Fish              Rainbow trout (*Oncorhynchus mykiss*) ..... 96-h LC<sub>50</sub>: 13.1 mg/l
- Invertebrates   Daphnids (*Daphnia magna*) ..... 48-h EC<sub>50</sub>: 5.4 mg/l
- Algae             Green algae (*Desmodesmus subspicatus*) ..... 72-h EC<sub>50</sub>: > 0.560 mg/l

The following was measured on the active ingredient **spiroxamine**:

- Fish              Rainbow trout (*Oncorhynchus mykiss*) ..... 56-day NOEC: 0.060 mg/l
- Invertebrates   Daphnids (*Daphnia magna*) ..... 21-day NOEC: 0.034 mg/l
- Algae             Diatoms (*Skeletonema costatum*) ..... 96-h E<sub>r</sub>C<sub>50</sub>: 0.0063 mg/l
- Plants             Duckweed (*Lemna gibba*) ..... 14-day NOAEC: 0.24 mg/l

The following was measured on the active ingredient **tebuconazole**:

- Fish              Rainbow trout (*Salmo gairdneri*) ..... 60-day NOEC: 0.012 mg/l
- Invertebrates   Daphnids (*Daphnia magna*) ..... 21-day NOEC: 0.12 mg/l
- Algae             Green algae (*Scenedesmus subspicatus*) ..... 72-h EC<sub>50</sub>: 5.3 mg/l
- Plants             Duckweed (*Lemna gibba*) ..... 14-day EC<sub>50</sub>: 0.144 mg/l

## 12.2. Persistence and degradability ....

**Spiroxamine** is not readily biodegradable. It is degraded by photolysis within a few weeks in water or on top of soil. Primary degradation half-life by biological degradation in aerobic water is less than 1 day. In aerobic soil it can vary with circumstances, usually from 1 to 50 days.

**Tebuconazole** is not readily biodegradable. It is slowly degraded in soil. Primary degradation half-lives vary with circumstances, usually from around 40 to 180 days in aerobic soil.

**Triadimenol** is not readily biodegradable. Primary degradation half-lives vary from several months to one year in aerobic soil depending on circumstances. It can accumulate in soil if applied in consecutive years.

The product contains not readily biodegradable ingredients, which may not be degradable in waste water treatment plants.

## 12.3. Bioaccumulative potential .....

See section 9 for octanol-water partition coefficients.

**Spiroxamine** has a low bioaccumulative potential. The Bioconcentration Factor (BCF) is measured to be 87 for whole fish (measured bluegill sunfish, *Lepomis macrochirus*). On ceasing of exposure, it is rapidly excreted.

**Tebuconazole** is considered to have a low bioaccumulative potential. The Bioconcentration Factor (BCF) of tebuconazole is measured to be 65 on average for whole fish (measured on several fish species).

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**Triadimenol** has a low potential for bioaccumulation, but is rapidly excreted. The bioaccumulation factor (BCF) is measured to 64 for whole fish (bluegill sunfish, *Lepomis macrochirus*).

- 12.4. **Mobility in soil** ..... All three active ingredients have low mobility in soil.
- 12.5. **Results of PBT and vPvB assessment** ..... None of the ingredients meets the criteria for being PBT or vPvB.
- 12.6. **Endocrine disrupting properties** ..... None of the ingredients is known to have endocrine disrupting properties.
- 12.7. **Other adverse effects** ..... Other relevant hazardous effects in the environment are not known.

#### ♣ SECTION 13: DISPOSAL CONSIDERATIONS

- 13.1. **Waste treatment methods** ..... Remaining quantities of the material and empty but unclean packaging should be regarded as hazardous waste.
- Disposal of product ..... Disposal of waste and packagings must always be in accordance with all applicable local regulations.
- Disposal of product ..... According to the Waste Framework Directive (2008/98/EC), possibilities for reuse or reprocessing should first be considered. If this is not possible, the material can be disposed of by removal to a licensed chemical destruction plant or by controlled incineration with flue gas scrubbing.
- Disposal of packaging ..... Do not contaminate water, foodstuffs, feed or seed by storage or disposal. Do not discharge to sewer systems.
- Disposal of packaging ..... It is recommended to consider possible ways of disposal in the following order:
1. Reuse or recycling should first be considered. Reuse is prohibited except by the authorisation holder. If offered for recycling, containers must be emptied and triply rinsed (or equivalent). Do not discharge rinsing water to sewer systems.
  2. Controlled incineration with flue gas scrubbing is possible for combustible packaging materials.
  3. Delivery of the packaging to a licensed service for disposal of hazardous waste.
  4. Disposal in a landfill or burning in open air should only occur as a last resort. For disposal in a landfill containers should be emptied completely, rinsed and punctured to make them unusable for other purposes. If burned, stay out of smoke.

#### ♣ SECTION 14: TRANSPORT INFORMATION

ADR/RID/IMDG/IATA/ICAO classification

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- 14.1. **UN number** ..... 1760
- 14.2. **UN proper shipping name** ..... Corrosive liquid, n.o.s. (spiroxamine, tebuconazole, triadimenol)
- 14.3. **Transport hazard class(es)** ..... 8
- 14.4. **Packing group** ..... III
- 14.5. **Environmental hazards** ..... Marine pollutant
- 14.6. **Special precautions for user** ..... Avoid any unnecessary contact with the product. Misuse can result in damage to health. Do not discharge to the environment.
- 14.7. **Maritime transport in bulk according to IMO instruments** .. The product is not transported in bulk by ship.

#### ♣ SECTION 15: REGULATORY INFORMATION

- 15.1. **Safety, health and environmental regulations/legislation specific for the substance or mixture** Seveso category in Annex I to Dir. 2012/18/EU: toxic  
 Second Seveso category: dangerous for the environment  
  
 Dir. 92/85/EEC: The employer shall assess the degree and duration of exposure at the workplace and any possible effect on pregnant women working with this product and decide which measures should be taken.  
  
 Young people under the age of 18 are not allowed to work with the substance.
- 15.2. **Chemical safety assessment** ..... A chemical safety assessment is not required to be included for this product.

#### ♣ SECTION 16: OTHER INFORMATION

- Relevant changes in the safety data sheet Numerous changes have been made to adapt the format of the safety data sheet, but these do not involve new information on hazardous properties.
- List of abbreviations ..... CAS Chemical Abstracts Service  
 Dir. Directive  
 DNEL Derived No Effect Level  
 EC European Community  
 EC<sub>50</sub> 50% Effect Concentration  
 ErC<sub>50</sub> 50% Effect Concentration based on growth  
 EINECS European INventory of Existing Commercial Chemical Substances  
 ELINCS European LIst of Notified Chemical Substances  
 FIFRA Federal Insecticide, Fungicide and Rodenticide Act  
 GHS Globally Harmonized classification and labelling System of chemicals, Fifth revised edition 2013



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IMO	International Maritime Organisation
ISO	International Organisation for Standardization
IUPAC	International Union of Pure and Applied Chemistry
LC <sub>50</sub>	50% Lethal Concentration
LD <sub>50</sub>	50% Lethal Dose
LOEL	Lowest Observed Effect Level
NOAEC	No Observed Adverse Effect Concentration
NOAEL	No Observed Adverse Effect Level
NOEC	No Observed Effect Concentration
n.o.s.	Not otherwise specified
OECD	Organisation for Economic Cooperation and Development
PBT	Persistent, Bioaccumulative, Toxic
PNEC	Predicted No Effect Concentration
Reg.	Registration, or Regulation
STOT	Specific Target Organ Toxicity
vPvB	very Persistent, very Bioaccumulative
WHO	World Health Organisation

References ..... Data measured on a similar product are unpublished company data.  
 Data on ingredients are available from published literature and can be found several places.

Method for classification ..... Acute oral toxicity: read-across  
 Acute inhalation toxicity: calculation method  
 Skin corrosion: read-across  
 Eye damage: calculation method  
 Toxic to reproduction: calculation method  
 Effects on or via lactation: calculation method  
 Specific target organ toxicity – single exposure: calculation method  
 Specific target organ toxicity – repeated exposure: calculation method  
 Hazards to the aquatic environment, acute: read-across  
 chronic: calculation method

Used hazard statements ..... H302 Harmful if swallowed.  
 H312 Harmful in contact with skin.  
 H314 Causes severe skin burns and eye damage.  
 H315 Causes skin irritation.  
 H317 May cause an allergic skin reaction.  
 H318 Causes serious eye damage.  
 H319 Causes serious eye irritation.  
 H332 Harmful if inhaled.  
 H335 May cause respiratory irritation.  
 H336 May cause drowsiness or dizziness.  
 H360Fd May damage fertility.  
 H360Fd May damage fertility and suspected of damaging the unborn child.  
 H361d Suspected of damaging the unborn child.  
 H362 May cause harm to the breast-fed child.  
 H373 May cause damage to the eyes through prolonged or



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- repeated exposure.
- H400 Very toxic to aquatic life.
- H410 Very toxic to aquatic life with long lasting effects.
- H411 Toxic to aquatic life with long lasting effects.
- H412 Harmful to aquatic life with long lasting effects.
- EUH208 Contains spiroxamine. May produce an allergic reaction.
- EUH401 To avoid risks to human health and the environment, comply with the instructions of use.

Advice on training ..... This material should only be used by persons who are made aware of its hazardous properties and have been instructed in the required safety precautions.

The information provided in this safety data sheet is believed to be accurate and reliable, but uses of the product vary and situations unforeseen by FMC Corporation may exist. The user has to check the validity of the information under local circumstances.

Prepared by: FMC Agricultural Solutions A/S / GHB