SAFETY INFORMATION SHEET

Date of Issue: May 2012
Revision: Nov 2015

1 IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1 Product Identifier: 50-50 MiNT

1.2 Relevant uses of the substance or mixture and uses advised against:
Fertiliser

1.3 Manufacturer/Distributor:
Vitax Limited
Owen Street
Coalville
LE67 3DE
Tel: 01530 510060 Fax: 01530 510299 Email: tech@vitax.co.uk

1.4 Emergency Contact: Tel: 01530 510060 (Office Hours)

2. HAZARDS IDENTIFICATION

2.1 Classification

Classification according to Regulation (EC) No 1272/2008 (EU-GHS/CLP)

Acute Tox. 4	H302 Harmful if swallowed.
Skin Irritation 2	H315 Causes skin irritation.
Eye Damage 1	H318 Causes serious eye damage
Aquatic Chronic 2	H411 Toxic to aquatic life with long lasting effects

Primary Hazard
Causes serious eye damage. Harmful if swallowed. Causes skin irritation.

2.2 Label Elements
Vitax 50/50 MiNT contains: Iron sulphate E.C. 231-753-5, Zinc suphate E.C. 231-793-3

Signal word: **Danger**

Hazard Statements:
H302 Harmful if swallowed
H315 Causes skin irritation
H318 Causes serious eye damage
H411 Toxic to aquatic life with long lasting effects
EUH208 Contains (reaction mass of: 5-chloro-2- methyl-4-isothiazolin-3-one [EC no. 247-500-7] and 2-methyl-2H -isothiazol-3- one [EC no. 220-239-6] (3:1). May produce an allergic reaction.

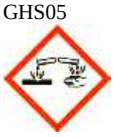
Precautionary Statements
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P302 + P352 IF ON SKIN: Wash with plenty of soap and water.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310 Immediately call a POISON Center or doctor/physician.
P362 Take off contaminated clothing and wash before reuse.
P391 Collect spillage
P501 Dispose of contents/container in accordance with local/national regulation

2.3 Other Hazards
Mixture not classed as PBT or vPvB

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.2 Mixtures

Chemical Name	CAS-No./ EINECS-No.	Annex Index or REACh number	Symbol(s)	R-phrase(s)	Concentration [%]
Iron sulphate	7720-78-7/ 231-753-5	Index number 026-003-00-7 REACh Number: 01 - 2119513203 – 57	According to 1272/2008: GHS07 	According to 1272/2008: Acute tox. 4, H302 Skin irrit. 2, H315 Eye Irrit. 2, H319 According to 67/548/EEC: R22, R36/38	10.0 – 19.9
Zinc sulphate	7733-02-0/ 231-793-3	Index No: 030-006-00-9 REACh No.: 01-2119474684-27	According to 1272/2008: GHS05  GHS07	According to 1272/2008: Acute Tox. 4 H302 Eye Damage 1 H318 Aquatic Acute 1 H400 Aquatic Chronic 1 H410	5.0 – 9.9

			GHS09 		
Manganese sulphate	10034-96-5/ 232-089-9	Index no.: 025-003-00-4 REACh registration no.: 01-2119456624-35	According to 1272/2008: GHS05  GHS08  GHS09 	According to 1272/2008: Eye Damage 1, H318 STOT Rep. 2, H373 Aqu. Tox. chron. 2, H411	<2.0
Citric acid	77-92-9/ 201-069-1	REACh number: 01-2119457026-42	According to 1272/2008: GHS07 	According to 1272/2008: Eye Irrit. 2, H319	<2.0
Boric acid	10043-35-3/ 233-139-2	Index No.: 005-007-00-2 REACh No: 01-2119486683-25	According to 1272/2008: GHS08 	According to 1272/2008: Repr. 1B H360	<1.0
Reaction mass of: 5-chloro-2- methyl-4-isothiazolin-3-one [EC no. 247-500-7] and 2-methyl-2H - isothiazol-3- one [EC no. 220-239-6] (3:1)	55965-84-9/ 611-341-5	Index number: 613-167-00-5	According to 1272/2008: GHS05  GHS06  GHS07  GHS08 	According to 1272/2008: Acute Tox. 3 * - H331 Acute Tox. 3 * - H311 Acute Tox. 3 * - H301 Skin Corr. 1B – H314 Skin Sens. 1 – H317 Aquatic Acute 1 – H400 Aquatic Chronic 1 – H410	<0.001

4. FIRST AID MEASURES

4.1 Description of first aid measures

4.1.1 Inhalation If symptoms arise remove from source of exposure to fresh air; seek medical attention if symptoms persist or develop

4.1.2 Skin & Eye exposure Skin: Drench immediately with water. Remove any contaminated clothing and launder before re-use. Obtain medical attention if symptoms develop or persist.
Eyes: Immediately rinse with clean water for 15 minutes. Obtain medical attention IMMEDIATELY.

4.1.3 Ingestion Do not induce vomiting. Wash out mouth with water and give water to drink. Obtain medical attention if symptoms develop or persist.

4.2 Most important symptoms and effects, both acute and delayed

Causes serious eye damage.

4.3 Indication of any immediate medical attention and special treatment needed.

Information not available.

5. FIRE-FIGHTING MEASURES

5.1 Extinguishing media Use foam, carbon dioxide, dry powder, sand. The mixture is not classified as flammable as such extinguishing media should also be chosen as appropriate for surrounding materials.

5.2 Special Hazards arising from the substance or mixture

Possible irritant fumes arising from combustion.

5.3 Advice for fire-fighters Cool down containers/equipment exposed to heat with a water spray. Contain spread of extinguishing fluids (these fluids may be hazardous for the environment). Wear complete protective clothing and self-contained breathing apparatus.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

The following precautions are considered to be good practice when using any chemicals irrespective of their classification unless otherwise specified. Ensure adequate ventilation. Use personal protective equipment, Gloves, Eye protection, Suitable respirator if dust is generated during handling

6.2 Environmental Precautions Do not allow to enter storm drains or water courses. If this product enters a water course or a sewer (including via contaminated soil & vegetation) in large quantities contact local water authority and inform the Environment Agency

6.3 Methods and material for containment and cleaning up

Use soil, sand or other absorbent material. Contact specialist waste disposal contractor.

6.4 Reference to other sections See also section 8

7. HANDLING AND STORAGE

7.1 Precaution for safe handling Avoid contact with skin and eyes. Wash hands thoroughly after handling. Do not eat, drink or smoke when using this product

7.2 Conditions for safe storage, including any incompatibilities

Store in a cool dry atmosphere, in original labelled containers. Refer to manufacturer for maximum safe stacking height. Keep away from heat sources, combustible materials and strong oxidising agents.

7.3 Specific end use(s) No Information available

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control Parameters

Workplace exposure Limits as defined by UK HSE in document EH40/2005 where available:

Substance	CAS number	Workplace Exposure Limit				Comments
		Long-term exposure limit (8-hr TWA reference period)		Short-term exposure limit (15 minute reference period)		The Carc, Sen and Sk notations are not exhaustive. Notations have been applied to the substances identified in IOELV Directives*
		ppm	$mg.m^{-3}$	ppm	$mg.m^{-3}$	
Manganese and its inorganic compounds (as Mn)		-	0.5	-	-	-
Iron salts (as Fe)		-	1.0	-	2.0	-

*IOELV – Indicative Occupational Exposure Limit Values (IOLEV).

8.2 Exposure controls The following precautions are considered to be good practice when using any chemicals irrespective of their classification unless otherwise specified. Primary Hazard considered as handling of concentrate. Gloves: to BS EN374 of gauntlet type in Natural Rubber or PVC (not Nitrile) recommended for acid resistance. Clothing: Coveralls/apron to BS EN465/466/467

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance;	Brown liquid
Odour;	No Information available
Odour threshold;	No Information available
pH;	1.7 ± 0.5
Melting point/freezing;	No Information available
Initial boiling point and boiling range;	No Information available
Flash point;	No Information available
Evaporation rate;	No Information available
Flammability (solid, gas);	Mixture is not classed as flammable
Upper /lower flammability or explosive limits;	Mixture is not classed as explosive
Vapour Pressure;	Negligible
Vapour density;	No Information available
Specific Gravity;	1.28 ± 0.2
Solubility (ies);	No Information available
Partition coefficient: n-octanol/water;	No Information available
Auto ignition temperature:	No Information available
Decomposition temperature:	No Information available
9.2 Other Information	No other relevant information available

10. STABILITY AND REACTIVITY

10.1 Reactivity	Unknown.
10.2 Chemical Stability	Stable under normal conditions
10.3 Possibility of hazardous reactions	No Information available.
10.4 Conditions to avoid	Extremes of temperature
10.5 Incompatible materials	None known
10.6 Hazardous decomposition products	Possible irritant fumes.

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

The mixture has not been assessed for toxicological effects, the mixture classification is given in section 2 based on individual component contents. Individual component hazards if any are given in section 3

Toxicological information on individual components where available:

Iron sulphate:

Toxicological information

Acute toxicity

The overall pattern of oral toxicity for iron salts is that they are harmful if swallowed. The human oral lethal dose is approximately 1000 mg/kg and 500-2000 mg/kg in rats. Toxic effects may, however, be produced by much lower doses especially when administered systemically. There is limited evidence that inhaled soluble iron salts are tolerated by rats plus limited evidence that inhaled soluble iron salts do not impair lung function and the dermal lethal dose would be greater than 2000 mg/kg. The dermal limit dose of Ferrous Chloride in rats is greater than 2,000 mg/kg (>881 mg Fe/kg) and thus should be used to compare against Ferrous Sulphate. This suggests little potential for systemic toxicity in humans after dermal contact.

Dose descriptor:

Oral - LD50S 300-2000 mg/kg bw
Dermal - LD50S >2000 mg/kg bw
Inhalation-No data

Skin corrosion / irritation

Ferrous Sulphate is skin irritant based on (2:1 animals majority) in rabbit test and is an eye irritant. Read across from Ferrous Sulphate and Ferric Chloride, indicates that solutions have the same or a lower classification than the solid and that classification based on pH would be overly cautious. On this basis an irritant classification, Skin Irritation Cat 2. H315: Causes skin irritation should be applied to solutions based on rules for mixtures. This classification therefore applies for solutions of concentration > 10%. Ferrous Sulphate should not be seen as corrosive just as an irritant.

Eye damage / irritation

Results are available for a GLP-compliant guideline study (Johnson, 2003), which showed that a 25% solution of Ferrous Sulphate Heptahydrate caused no more than mild redness and chemosis after instillation into the rabbit eye. The predicted

	classification based on reading across of several iron salts would be a classification between no classification and causes serious eye damage however due to the lack of test data and low pH (<2) a precautionary approach should be taken with classification as Eye Damage 2.
Respiratory / Skin sensitisation	Ferrous Sulphate Heptahydrate has been tested in a guideline, GLP, Local Lymph Node Assay (Stitzinger, 2010: reliability 1). In this test Ferrous Sulphate gave a clear negative result and is therefore not considered a skin sensitiser. Results of a reliable LLNA test were clearly negative for Ferrous Sulphate Heptahydrate. There are a few case studies in which human subjects showed signs of sensitisation to iron; however overall these data are poor and do not provide convincing evidence of a positive reaction in humans. There is also poor evidence in animal studies of sensitisation as a result of exposure to iron. The widespread exposure of iron and its role in biological processes, together with the extensive use of dietary supplements suggest that sensitisation is not a concern.
Germ cell mutagenicity	With regard to their mutagenic properties, iron salts have been extensively tested in microbial and mammalian systems in vitro, and in mammalian and insect tests in vivo. There are inconsistencies in the in vitro findings, with a small number of studies returning positive results. This has been attributed to DNA damage following reduction of Fe(III) to Fe(II) with free radical or superoxide formation and subsequent redox recycling. This contrasts with the consistently negative results obtained in vivo where, presumably, more efficient control mechanisms exist that protect the body from iron-induced oxidative damage. It is concluded that iron salts are not genotoxic. Due to its potential pro-oxidant effects, there has been extensive research into possible links between iron and cancer development. These include many clinical investigations into the effects of oral (dietary) iron salts in humans and links to cancer. Although iron has been implicated in the development of cancers at various sites because of its role as a pro-oxidant, the UK Scientific Advisory Committee on Nutrition concluded that there is not enough evidence to reach conclusions for any specific links (EVM, 2003).
Reproductive toxicity	Results from recent guideline oral screening studies performed on Ferrous Chloride and Ferrous Sulphate gave NOAELs for reproductive and developmental effects of >500 mg/kg body weight/day or >1000 mg/kg body weight/day (no adverse effects were observed), respectively. These findings are considered to be relevant to Ferric as well as Ferrous salts, as oxidation of Ferrous to Ferric occurs in the low pH of stomach before ingested iron is absorbed into the body. In humans, iron supplementation of about 5.8 to 11.7 mg/kg bw/day (for a 60kg individual) is routinely prescribed throughout pregnancy with no adverse effects on pregnancy outcome. Evidence of adverse effects on male testes has only been observed at acutely toxic, overload doses, at which some of the experimental animals died.
Dose descriptor:	Oral - LD50S >1000 mg/kg bw day Dermal - No data Inhalation - No data
Repeated dose toxicity	No human data is available for Ferrous Sulphate and repeated dose toxicity and even though effects are shown in some animal studies the overall conclusion is that no classification should be assigned for all endpoints oral, inhalation and dermal. NOAEL 49 days –l00mg/kg Ferrous Sulphate Heptahydrate, result = no effect.
Aspiration hazard	No data, not an aspiration hazard.

Zinc sulphate:

Toxic Dose 1 - LD 50	862 - 4429 mg/kg (oral rat)
Acute Toxicity (Dermal LD50)	> 2000 mg/kg Rat
Health Warnings	INHALATION. Prolonged inhalation of high concentrations may damage respiratory system. SKIN CONTACT. Acts as a defatting agent on skin. May cause cracking of skin, and eczema. Prolonged or repeated exposure may cause severe irritation. EYE CONTACT. May cause severe irritation to eyes. INGESTION. The product causes irritation of mucous membranes and may cause abdominal discomfort if swallowed.
Target Organs	Skin Eyes Respiratory system, lungs

Manganese sulphate:

HEALTH WARNINGS	INHALATION. Prolonged inhalation of high concentrations may damage respiratory system. SKIN CONTACT. Acts as a defatting agent on skin. May cause cracking of skin, and eczema. Prolonged or repeated exposure may cause severe irritation. EYE CONTACT. May cause severe irritation to eyes. INGESTION. The product causes irritation of mucous membranes and may cause abdominal discomfort if swallowed.
TARGET ORGANS	Skin Eyes Respiratory system, lungs

Citric acid

Acute toxicity

LD/LC50 Oral	3000mg/Kg (rat)

Primary irritant effect:

On the skin:	No irritant effect
On the eye:	Irritating effect
Sensitisation:	No sensitising effects known
Additional toxicological information:	The product shows the following dangers according to the calculation method of the General EU Classification Guidelines for Preparations as issued in the latest version: Irritant
Routes of exposure:	The substance can be absorbed into the body by inhalation (of solution mist and dust) and by ingestion.

Boric acid

Acute toxicity:

Acute Toxicity (Oral LD50)	> 2000 mg/kg Rat

Test method(s): OECD 401.

Acute Toxicity (Dermal LD50)	> 2000 mg/kg Rabbit

Test method(s): FIFRA (40 CFR 163)

Acute Toxicity (Inhalation LC50)	> 2.03 mg/l (dust/mist) Rat 4 hours

Test method(s): OECD 403.

Skin Corrosion/Irritation:

Dose	500 mg 24 hr Rabbit
Primary dermal irritation index (PDI)	0.1 (72hr)
Erythema\eschar score	Very slight erythema -barely perceptible (1).
Oedema score	No oedema (0).
Test method(s): FIFRA (40 CFR 163)	Not classified.
Serious eye damage/irritation:	Not classified.

Test method(s): equivalent or similar to OECD 405.

Respiratory or skin sensitisation:

Skin sensitisation Buehler test: Guinea Pig

Test method(s): OECD 406.	Not Sensitising.

Germ cell mutagenicity:

Genotoxicity - In Vitro	Negative.

Gene Mutation: Test method(s): OECD 471.

Genotoxicity - In Vivo	Negative.

Chromosome aberration: Test method(s): equivalent or similar to OECD 474.

Carcinogenicity:	Not classified.
Carcinogenicity	NOEL>1150 mg/kg Oral Mouse

Test method(s): equivalent or similar to OECD 451.

Reproductive Toxicity:

Reproductive Toxicity – Fertility	Known reproductive toxicant based on animal evidence.
Three-generation study: LOAEL	58.5 mg/kg Oral Rat P

The units are expressed in 'mg/µg' of: Boron. Test method(s): Toxicology and Applied Pharmacology 23: 351 - 364.

Reproductive Toxicity – Development	May damage the unborn child.
Developmental toxicity: NOAEC	21.8 mg/kg Oral Rabbit

The units are expressed in 'mg/µg' of: Boron. Test method(s): equivalent or similar to OECD 414.

Specific target organ toxicity - single exposure:

STOT - Single exposure	No information available.

Specific target organ toxicity - repeated exposure: Not classified.

STOT - Repeated exposure LOAEL	58.5 mg/kg Oral Rat

Test method(s): Toxicology and Applied Pharmacology 23: 351 - 364.

Aspiration hazard:	No data available.

Inhalation	Dust may irritate throat and respiratory system and cause coughing.
Ingestion	Irritating. May cause nausea, stomach pain and vomiting.
Skin contact	May cause skin irritation/eczema.
Eye contact	Irritating and may cause redness and pain.

reaction mass of: 5-chloro-2- methyl-4-isothiazolin-3-one [EC no. 247-500-7] and 2-methyl-2H -isothiazol-3- one [EC no. 220-239-6] (3:1)

Oral LD50:		67 mg/Kg (rat)
Dermal LD50:		>140 mg/Kg (rat)
Inhalation	LC50/4hr	0.17 mg/l (rat) Aerosol THR 48/971458
Primary irritant effect:		
On the skin:		Caustic effect on skin and mucous membranes
On the eye:		Strong caustic effect
Sensitization:		Sensitization possible by skin contact

12. ECOLOGICAL INFORMATION

12.1 Toxicity	Mixture classified as toxic to aquatic life with long lasting effects.
12.2 Persistence and degradability	Information not available.
12.3 Bioaccumulative potential	Information not available.
12.4 Mobility in soil	Information not available.
12.5 Results of PBT and vPvB	Not classified
12.6 Other adverse effects	Information not available

13. DISPOSAL CONSIDERATIONS

13.1 Waste Treatment Methods	Use only licensed waste disposal companies for unwanted chemical. Do not re-use empty containers for any purpose.

14. TRANSPORT INFORMATION

14.1 UN number:	UN3082
14.2 UN proper shipping name:	Environmentally hazardous preparation, liquid N.O.S. (contains: Iron sulphate E.C. 231-753-5, Zinc suphate E.C. 231-793-3)
14.3 Transport hazard	9
14.4 Packing group:	III
14.5 Environmental hazards:	Product is classified as toxic to aquatic life with long lasting effects.
14.6 Special precautions for user:	No information available

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC code

Applicable for Maritime bulk transport only. Check with carrier.

15. REGULATORY INFORMATION

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture.

This substance is classified and labelled in accordance with Directive 1999/45/EC regulation (EC) 1272/2008 and the EC Fertiliser Regulations 2003, Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC, including amendments. Regulation (EC)

15.2 Chemical Safety Assessment CSA not undertaken for this mixture

16. OTHER INFORMATION

Hazard Information not otherwise listed in full elsewhere:

H301: Toxic if swallowed
H311: Toxic in contact with skin.
H314: Causes severe skin burns and eye damage
H317: May cause an allergic skin reaction.
H319: Causes serious eye irritation.
H331: Toxic if swallowed or if inhaled
H360FD: May damage fertility. May damage the unborn child.
H373: May cause damage to organs through prolonged or repeated exposure
H400: Toxic to aquatic life.

	H410: Very toxic to aquatic life with long lasting effects.
SDS information:	This Safety data sheet is compiled using data submitted for raw materials and practical experience. This product is intended for professional users only. This Safety Data Sheet is prepared in compliance with Directive 1999/45/EC, regulation 1272/2008 and Annex I of the REACH regulation 453/2010. The information given herein is, to the best of our knowledge, correct and is presented in good faith but no warranty, expressed or implied is given.