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SAFETY DATA SHEET

YaraVita GRAMITREL

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Product name	:	YaraVita GRAMITREL
Product code	:	PYP51M
Product type	:	liquid (Suspension)

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses
Industrial distribution. Industrial USE to formulate chemical product mixtures. Professional formulation of fertiliser products. Professional USE as fertiliser at Farm - loading and spreading. Professional USE as fertiliser in Greenhouse. Professional USE as liquid fertiliser in open field (e.g. Fertigation). Professional USE as fertiliser - maintenance of equipment.

Uses advised against	:	Other non-specified industry
Reason	:	Due to lack of related experience or data, the supplier cannot approve this use.

1.3 Details of the supplier of the safety data sheet

Yara UK Limited

Address

Street	:	Harvest House, Europarc
Postal code	:	DN37 9TZ
City	:	Grimsby, North East Lincolnshire
Country	:	United Kingdom
Telephone number	:	+44 (0) 1472 889250
Fax no.	:	+44 (0) 1472 889251
e-mail address of person responsible for this SDS	:	yarauk.hesq@yara.com

1.4 Emergency telephone number

National advisory body/Poison Center : Not available.

Supplier
Emergency telephone number (with hours of operation) : National Chemical Emergency Centre
+44 (0) 1865 407333 (24h)

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture.

Product definition : Mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]

Classification : Eye Dam. 1, H318
Aquatic Acute 1, H400
Aquatic Chronic 2, H411

The product is classified as hazardous according to Regulation (EC) 1272/2008 as amended.

See Section 16 for the full text of the H statements declared above.
See Section 11 for more detailed information on health effects and symptoms.

2.2 Label elements

Hazard pictograms :

Signal word : Danger

Hazard statements :

H318	Causes serious eye damage.
H400	Very toxic to aquatic life.
H411	Toxic to aquatic life with long lasting effects.

Precautionary statements

Prevention :

P280	Wear protective clothing and eye protection.
P273	Avoid release to the environment.

Response :

P391	Collect spillage.
P305	IF IN EYES:
P351	Rinse cautiously with water for several minutes.
P338	Remove contact lenses, if present and easy to do. Continue rinsing.
P310	Immediately call a POISON CENTER or doctor/physician.

Hazardous ingredients : dicopper oxide

EU Regulation (EC) No. 1907/2006 (REACH) Annex XVII - Restrictions on the : Applicable, Table 3.

manufacture, placing on the market and use of certain dangerous substances, mixtures and articles

Special packaging requirements

Containers to be fitted with child-resistant fastenings : Not applicable.

Tactile warning of danger : Not applicable.

2.3 Other hazards

Other hazards which do not result in classification : None.

SECTION 3: Composition/information on ingredients

3.2 Mixtures : Mixture

Product/ingredient name	Identifiers	%	Regulation (EC) No. 1272/2008 [CLP]	Type
manganese carbonate	RRN: Not available. EC: 209-942-9 CAS : 598-62-9	>= 20 - < 25	Not classified.	[2]
zinc oxide	RRN: 01-2119463881-32 EC: 215-222-5 CAS : 1314-13-2 Index: 030-013-00-7	>= 5 - < 7	Aquatic Acute 1, H400 Aquatic Chronic 1, H410	[1]
dicopper oxide	RRN: 01-2119513794-36 EC: 215-270-7 CAS : 1317-39-1 Index: 029-002-00-X	>= 3 - < 5	Acute Tox. 4, H302 Acute Tox. 4, H332 Eye Dam. 1, H318 Aquatic Acute 1, H400 Aquatic Chronic 1, H410 M-factor : 100 - AQUATIC HAZARD (ACUTE),	[1]
ethanediol	RRN: 01-2119456816-28 EC: 203-473-3 CAS : 107-21-1 Index: 603-027-00-1	>= 1 - < 2	Acute Tox. 4, H302 STOT RE 2, H373 (kidneys) (oral)	[1] [2]
2-propenoic acid, homopolymer,	RRN: Not available.	>= 1 - < 2	Eye Irrit. 2, H319	[1]

sodium salt	EC: 618-349-8 CAS : 9003-04-7			

Type
[1] Substance classified with a physical, health or environmental hazard
[2] Substance with a workplace exposure limit
[3] Substance meets the criteria for PBT according to Regulation (EC) No. 1907/2006, Annex XIII
[4] Substance meets the criteria for vPvB according to Regulation (EC) No. 1907/2006, Annex XIII
[5] Substance of equivalent concern

See Section 16 for the full text of the H statements declared above.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment, are PBTs, vPvBs or Substances of equivalent concern, or have been assigned a workplace exposure limit and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

SECTION 4: First aid measures

4.1 Description of first aid measures

Eye contact : Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Check for and remove any contact lenses. Get medical attention immediately.

Inhalation : Avoid inhalation of vapor, spray or mist. If inhaled, remove to fresh air. Get medical attention immediately. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus.

Skin contact : Wash with soap and water. Get medical attention if irritation develops.

Ingestion : Wash out mouth with water. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

4.2 Most important symptoms and effects, both acute and delayed

Over-exposure signs/symptoms

Eye contact : Adverse symptoms may include the following:
pain
watering
redness

Inhalation : No specific data.

Skin contact : No specific data.

Ingestion : May cause burns to mouth, throat and stomach.

4.3 Indication of any immediate medical attention and special treatment needed

Notes to physician : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

Specific treatments : No specific treatment.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media : Use an extinguishing agent suitable for the surrounding fire.

Unsuitable extinguishing media : None identified.

5.2 Special hazards arising from the substance or mixture

Hazards from the substance or mixture : In a fire or if heated, a pressure increase will occur and the container may burst. This material is very toxic to aquatic life. This material is toxic to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.

Hazardous combustion products : Decomposition products may include the following materials:
nitrogen oxides
metal oxide/oxides
ammonia
Avoid breathing dusts, vapors or fumes from burning materials.
In case of inhalation of decomposition products in a fire, symptoms may be delayed.

5.3 Advice for firefighters

Special protective actions for fire-fighters : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

For non-emergency personnel : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Do not breathe vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see Section 8).

For emergency responders : If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

6.2 Environmental precautions

: Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities. Collect spillage.

6.3 Methods and materials for containment and cleaning up

Small spill : Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Large spill : Stop leak if without risk. Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations. Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product.

6.4 Reference to other sections

: See Section 1 for emergency contact information.
See Section 8 for information on appropriate personal protective equipment.
See Section 13 for additional waste treatment information.

SECTION 7: Handling and storage

The information in this section contains generic advice and guidance. The list of Identified Uses in Section 1 should be consulted for any available use-specific information provided in the Exposure Scenario(s).

7.1 Precautions for safe handling

Not for human or animal consumption.

Protective measures : Put on appropriate personal protective equipment (see

Section 8). Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not ingest. Avoid release to the environment. If during normal use the material presents a respiratory hazard, use only with adequate ventilation or wear appropriate respirator. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

Advice on general occupational hygiene : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

7.2 Conditions for safe storage, including any incompatibilities

Recommendations : Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination. Bund storage facilities to prevent soil and water pollution in the event of spillage.

Seveso Directive - Reporting thresholds

Danger criteria

Category	Notification and MAPP threshold	Safety report threshold
E1: Hazardous to the aquatic environment - Acute 1 or Chronic 1	100 t	200 t

7.3 Specific end use(s)

Recommendations : Not available.

SECTION 8: Exposure controls/personal protection

The list of Identified Uses in Section 1 should be consulted for any available use-specific information provided in the Exposure Scenario(s).

8.1 Control parameters

Occupational exposure limits

Product/ingredient name	Exposure limit values
manganese carbonate	**EH40/2005 WELs (2003-05-01)** TWA 0.5 mg/m3 (as Mn) **EU OEL (2017-02-21)** TWA 0.05 mg/m3 (as Mn) Form: Respirable fraction TWA 0.2 mg/m3 (as Mn) Form: Inhalable fraction

ethanediol	**EU OEL (2000-06-01) Absorbed through skin.** TWA 52 mg/m3 20 ppm STEL 104 mg/m3 40 ppm **EH40/2005 WELs (2001-12-01) Absorbed through skin.** TWA 10 mg/m3 Form: Particulate matter **EH40/2005 WELs (2005-04-06) Absorbed through skin.** STEL 104 mg/m3 40 ppm Form: Vapor TWA 52 mg/m3 20 ppm Form: Vapor

Recommended monitoring procedures : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.
Reference should be made to monitoring standards, such as the following:
European Standard EN 689 (Workplace atmospheres - Guidance for the assessment of exposure by inhalation to chemical agents for comparison with limit values and measurement strategy)
European Standard EN 14042 (Workplace atmospheres - Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents)
European Standard EN 482 (Workplace atmospheres - General requirements for the performance of procedures for the measurement of chemical agents)
Reference to national guidance documents for methods for the determination of hazardous substances will also be required.

DNELs/DMELs

Product/ingredient name	Type	Exposure	Value	Population	Effects
dicopper oxide	DNEL	Long term Dermal	137 mg/kg bw/day	Workers	Systemic
	DNEL	Long term Oral	0.041 mg/kg bw/day	Consumers	Systemic
zinc oxide	DNEL	Long term Inhalation	5 mg/m³	Workers	Systemic
manganese carbonate	DNEL	Long term Dermal	0.004 mg/kg bw/day	Workers	Systemic
	DNEL	Long term Inhalation	0.2 mg/m³	Workers	Systemic
	DNEL	Long term Dermal	0.002 mg/kg bw/day	Consumers	Systemic
	DNEL	Long term Inhalation	0.043 mg/m³	Consumers	Systemic

PNECs

Product/ingredient name	Type	Compartment Detail	Value	Method Detail
dicopper oxide	PNEC	Fresh water	0.0078 mg/l	Assessment Factors
	PNEC	Marine water	0.0052 mg/l	Assessment Factors
	PNEC	Fresh water sediment	87 mg/kg dwt	Assessment Factors

	PNEC	Marine water sediment	676 mg/kg dwt	Assessment Factors
	PNEC	Soil	65 mg/kg dwt	Assessment Factors
	PNEC	Sewage Treatment Plant	0.23 mg/l	Assessment Factors
zinc oxide	PNEC	Fresh water	20.6 µg/l	Assessment Factors
	PNEC	Salt water	6.1 µg/l	Assessment Factors
	PNEC	Fresh water sediment	235.6 mg/kg	Assessment Factors
	PNEC	Sediment	113 mg/kg	Assessment Factors
	PNEC	Soil	106.8 mg/kg	Assessment Factors
	PNEC	Sewage Treatment Plant	52 µg/l	Assessment Factors
manganese carbonate	PNEC	Fresh water	0.0084 mg/l	Assessment Factors
	PNEC	Marine water	0.0008 mg/l	Assessment Factors
	PNEC	Fresh water sediment	8.18 mg/kg dwt	Assessment Factors
	PNEC	Marine water sediment	0.81 mg/kg dwt	Assessment Factors
	PNEC	Soil	8.15 mg/kg dwt	Assessment Factors
	PNEC	Sewage Treatment Plant	100 mg/l	Assessment Factors

8.2 Exposure controls

Appropriate engineering controls : If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

Individual protection measures

Hygiene measures : A washing facility or water for eye and skin cleaning purposes should be present. Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Wash contaminated clothing before reusing.

Eye/face protection : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts.
Recommended: Tightly-fitting goggles, CEN: EN166,

Skin protection

Hand protection : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. For general applications, we recommend gloves with a thickness typically greater than

		0.35 mm. It should be emphasized that glove thickness is not necessarily a good predictor of glove resistance to a specific chemical, as the permeation efficiency of the glove will be dependent on the exact composition of the glove material.
Body protection	:	Personal protective equipment for the body should be selected based on the task being performed and the risks involved.
Other skin protection	:	Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
Respiratory protection	:	In case of inadequate ventilation wear respiratory protection.
Environmental exposure controls	:	Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.
Personal protective equipment (Pictograms)	:	

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance

Physical state	:	liquid (Suspension)
Color	:	Pink,
Odor	:	Odorless.
Odor threshold	:	Not determined.
pH	:	10 [Conc. (% w/w): 100 g/l]
Melting point/freezing point	:	-5 °C
Initial boiling point and boiling range	:	100 °C
Flash point	:	Not determined
Evaporation rate	:	Not determined
Flammability (solid, gas)	:	Non-flammable.
Upper/lower flammability or explosive limits	:	**Lower:** Not determined **Upper:** Not determined
Vapor pressure	:	Not determined
Vapor density	:	Not determined
Relative density	:	Not applicable.
Bulk density	:	Not applicable.
Density	:	1.636 g/cm3
Solubility(ies)	:	Not applicable.

Miscibility with water	:	Miscible in water.
Partition coefficient: n-octanol/water	:	Not determined
Auto-ignition temperature	:	Not determined
Viscosity	:	**Dynamic:** 1,500 - 2,500 mPa.s **Kinematic:**Not determined
Explosive properties	:	Non-explosive.
Oxidizing properties	:	None

9.2 Other information
No additional information.

SECTION 10: Stability and reactivity

10.1 Reactivity	:	No specific test data related to reactivity available for this product or its ingredients.
10.2 Chemical stability	:	The product is stable.
10.3 Possibility of hazardous reactions	:	Under normal conditions of storage and use, hazardous reactions will not occur.
10.4 Conditions to avoid	:	Avoid contamination by any source including metals, dust and organic materials.
10.5 Incompatible materials	:	Urea reacts with calcium hypochlorite or sodium hypochlorite to form the explosive nitrogen trichloride.
10.6 Hazardous decomposition products	:	Under normal conditions of storage and use, hazardous decomposition products should not be produced.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Product/ingredient name	Method	Species	Result	Exposure	References
ethanediol					
	LD50 Oral	Rat	7,712 mg/kg	Not applicable.	ECHA
2-propenoic acid, homopolymer, sodium salt					
	LD50 Oral	Rat	> 40,000 mg/kg	Not applicable.	PSTGAW 20,16,1953
dicopper oxide					
	OECD 401 LD50 Oral	Rat - Female	> 928 mg/kg	Not applicable.	IUCLID 5
	OECD 403 LC50 Inhalation	Rat	3.34 mg/l	4 h	IUCLID 5

	Dusts and mists				
	OECD 402 LD50 Dermal	Rabbit	> 5,000 mg/kg	Not applicable.	IUCLID
zinc oxide					
	LD50 Oral	Rat	> 5,000 mg/kg	Not applicable.	IUCLID 5
	LC50 Inhalation Dusts and mists	Rat	> 5.7 mg/l	4 h	IUCLID 5
manganese carbonate					
	OECD 420 LD50 Oral	Rat	> 5,000 mg/kg	Not applicable.	CSR

Conclusion/Summary : No known significant effects or critical hazards.

Acute toxicity estimates

Route	ATE value
Oral	10,618.9 mg/kg
Inhalation (dusts and mists)	94.62 mg/l

Irritation/Corrosion

Product/ingredient name	Method	Species	Result	Exposure	References
2-propenoic acid, homopolymer, sodium salt					
	Eyes	Rabbit	Moderate irritant		
dicopper oxide					
	OECD 405 Eyes	Rabbit	Moderate irritant	21 d	IUCLID 5

Conclusion/Summary
Skin : No known significant effects or critical hazards.
Eyes : Causes serious eye damage.
Respiratory : No known significant effects or critical hazards.

Sensitization

Product/ingredient name	Method	Species	Result	References
dicopper oxide				
	OECD 406 Skin	Pig	Not sensitizing	

Conclusion/Summary
Skin : No known significant effects or critical hazards.
Respiratory : No known significant effects or critical hazards.

Mutagenicity

Conclusion/Summary : No known significant effects or critical hazards.

Carcinogenicity

Conclusion/Summary : No known significant effects or critical hazards.

Reproductive toxicity

Product/ingredient name	Method	Species	Result	Exposure	References

dicopper oxide					
	OECD 416 Oral	Rat	Fertility effects- Negative LOAEL > 1500 mg/kg		IUCLID 5
	OECD 414 Oral	Rabbit	Developmental- Negative NOAEL 6 mg/kg bw/day		IUCLID 5

Conclusion/Summary : No known significant effects or critical hazards.

Specific target organ toxicity (repeated exposure)

Product/ingredient name	Category	Route of exposure	Target organs
ethanediol	Category 2	oral	kidneys

Information on the likely routes of exposure : Not available.

Potential acute health effects

Inhalation : Vapor may be irritating to eyes and respiratory system. Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.

Ingestion : May cause burns to mouth, throat and stomach.

Skin contact : No known significant effects or critical hazards.

Eye contact : Causes serious eye damage.

Symptoms related to the physical, chemical and toxicological characteristics

Inhalation : No specific data.

Ingestion : May cause burns to mouth, throat and stomach.

Skin contact : No specific data.

Eye contact : Adverse symptoms may include the following: pain watering redness

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects : No known significant effects or critical hazards.

Potential delayed effects : No known significant effects or critical hazards.

Long term exposure

Potential immediate effects : No known significant effects or critical hazards.

Potential delayed effects : No known significant effects or critical hazards.

Potential chronic health effects

Product/ingredient name	Method	Species	Result	Exposure	References

dicopper oxide					
	OECD 408 Sub-chronic NOAEL Oral	Rat	1,000 mg/kg	92 days 7 days per week	IUCLID 5

Carcinogenicity : No known significant effects or critical hazards.

Mutagenicity : No known significant effects or critical hazards.

Fertility effects : No known significant effects or critical hazards.

Developmental effects : No known significant effects or critical hazards.

Effects on or via lactation : No known significant effects or critical hazards.

Other effects : No known significant effects or critical hazards.

Other information : Not available.

SECTION 12: Ecological information

12.1 Toxicity

Product/ingredient name	Method	Species	Result	Exposure	References
ethanediol					
	Acute LC50 Fresh water	Fish	> 72,860 mg/l	96 h	ECHA
2-propenoic acid, homopolymer, sodium salt					
	Acute LC50 Fresh water	Fish.	> 200 mg/l	96 h	
dicopper oxide					
	Acute LC50 Fresh water	Fish	0.08 - 0.28 mg/l	96 h	IUCLID 5
	OECD 211 Acute EC50 Fresh water	Water flea	0.028 - 0.792 mg/l	21 d	IUCLID 5
	OECD 201 Acute EC50 Fresh water	Algae	0.333 mg/l	72 h	IUCLID 5
zinc oxide					
	Acute NOEC Fresh water	Fish.	0.026 - 0.075 mg/l	720 h	IUCLID 5
	Acute LC50 Fresh water	Crustaceans	0.14 mg/l	24 h	IUCLID 5
	Acute EC50 Fresh water	Water flea	1 - 10 mg/l	48 h	IUCLID 5
	OECD 201 Acute IC50 Fresh water	Algae	0.136 mg/l	72 h	IUCLID

Conclusion/Summary : Very toxic to aquatic life. Toxic to aquatic life with long lasting effects.

12.2 Persistence and degradability

Conclusion/Summary : No known significant effects or critical hazards.

12.3 Bioaccumulative potential

Product/ingredient name	LogPow	BCF	Potential
ethanediol	-1.36	Not applicable.	low

Conclusion/Summary : No known significant effects or critical hazards.

12.4 Mobility in soil

Soil/water partition coefficient (KOC) : Not available.

Mobility : Not available.

12.5 Results of PBT and vPvB assessment

PBT : Not applicable.

vPvB : Not applicable.

12.6 Other adverse effects : No known significant effects or critical hazards.

SECTION 13: Disposal considerations

The information in this section contains generic advice and guidance. The list of Identified Uses in Section 1 should be consulted for any available use-specific information provided in the Exposure Scenario(s).

13.1 Waste treatment methods

Product

Methods of disposal : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction.

Hazardous waste : Yes.

European waste catalogue (EWC)

Waste code	Waste designation
06 03 13*	solid salts and solutions containing heavy metals

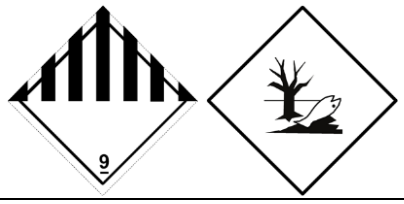
Packaging

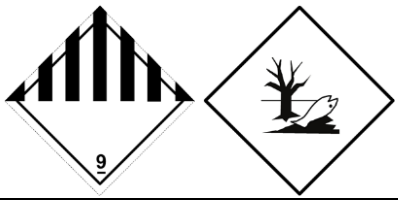
Methods of disposal : The generation of waste should be avoided or minimized wherever possible. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible.

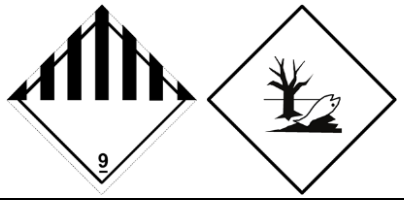
Special precautions : This material and its container must be disposed of in a safe way.
Care should be taken when handling emptied containers that have not been cleaned or rinsed out.

Empty containers or liners may retain some product residues.
Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

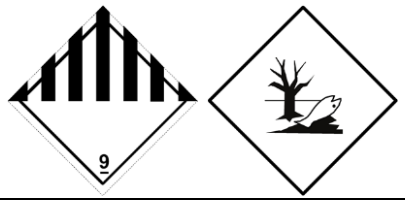
SECTION 14: Transport information

Regulation: ADR/RID	
14.1 UN number	3082
14.2 UN proper shipping name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (dicopper oxide, zinc oxide,)
14.3 Transport hazard class(es)	9 
14.4 Packing group	III
14.5 Environmental hazards	Yes.
Additional information	
Hazard identification number : 90	

Regulation: ADN	
14.1 UN number	3082
14.2 UN proper shipping name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (dicopper oxide, zinc oxide,)
14.3 Transport hazard class(es)	9 
14.4 Packing group	III
14.5 Environmental hazards	Yes.
Additional information	
Danger code : N1	

Regulation: IMDG	
14.1 UN number	3082
14.2 UN proper shipping name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (dicopper oxide, zinc oxide,)
14.3 Transport hazard class(es)	9 
14.4 Packing group	III

14.5 Environmental hazards	Yes.
Additional information	
Marine pollutant	: Yes.
Emergency schedules (EmS)	: F-A, S-F

Regulation: IATA	
14.1 UN number	3082
14.2 UN proper shipping name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (dicopper oxide, zinc oxide,)
14.3 Transport hazard class(es)	9 
14.4 Packing group	III
14.5 Environmental hazards	Yes.
Additional information	
Marine pollutant	: Yes.

14.6 Special precautions for user : Transport within user's premises: Ensure that persons transporting the product know what to do in the event of an accident or spillage.

14.7 Transport in bulk according to Annex II of MARPOL and the IBC Code

Not available.

14.8 IMSBC : Not applicable.

SECTION 15: Regulatory information

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

EU Regulation (EC) No. 1907/2006 (REACH)

Annex XIV - List of substances subject to authorization

Annex XIV: None of the components are listed.

Substances of very high concern: None of the components are listed.

EU Regulation (EC) No. 1907/2006 (REACH) Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles : Applicable, Table 3.

Other EU regulations

Ozone depleting substances (1005/2009/EU)

None of the components are listed.

Prior Informed Consent (PIC) (649/2012/EU)

None of the components are listed.

Seveso Directive

This product is controlled under the Seveso Directive.

Danger criteria

Category
E1: Hazardous to the aquatic environment - Acute 1 or Chronic 1

National regulations

Biocidal products regulation : Not applicable.

Notes : To our knowledge no other country or state specific regulations are applicable.

15.2 Chemical Safety Assessment : Complete.

SECTION 16: Other information

Abbreviations and acronyms :
ATE = Acute Toxicity Estimate
CLP = Classification, Labelling and Packaging Regulation [Regulation (EC) No. 1272/2008]
DNEL = Derived No Effect Level
DMEL = Derived Minimal Effect Level
EUH statement = CLP-specific Hazard statement
PNEC = Predicted No Effect Concentration
RRN = REACH Registration Number
PBT = Persistent, Bioaccumulative and Toxic
vPvB = Very Persistent and Very Bioaccumulative
bw = Body weight

Key data sources :
EU REACH IUCLID5 CSR.
National Institute for Occupational Safety and Health, U.S. Dept. of Health, Education, and Welfare, Reports and Memoranda Registry of Toxic Effects of Chemical Substances.
Sphera Solutions Inc., 4777 Levy Street, St Laurent, Quebec HAR 2P9, Canada.
Regulation (EC) No 1272/2008 Annex VI.

Procedure used to derive the classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]

Classification	Justification
Eye Dam. 1, H318	Calculation method
Aquatic Acute 1, H400	Calculation method
Aquatic Chronic 2, H411	Calculation method

Full text of abbreviated H statements

H302	Harmful if swallowed.
H318	Causes serious eye damage.

H332	Harmful if inhaled.
H373	May cause damage to organs through prolonged or repeated exposure.
H373 (oral)	May cause damage to organs through prolonged or repeated exposure if swallowed.
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.

Full text of classifications [CLP/GHS]

Acute Tox. 4, H302	ACUTE TOXICITY (oral) - Category 4
Eye Dam. 1, H318	SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 1
Acute Tox. 4, H332	ACUTE TOXICITY (inhalation) - Category 4
STOT RE 2, H373	SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 2
STOT RE 2, H373 (oral)	SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) (oral) - Category 2
Aquatic Acute 1, H400	AQUATIC HAZARD (ACUTE) - Category 1
Aquatic Chronic 1, H410	AQUATIC HAZARD (LONG-TERM) - Category 1
Aquatic Chronic 2, H411	AQUATIC HAZARD (LONG-TERM) - Category 2

Revision comments	:	The following sections contain new and updated information: 9.
Date of printing	:	27.04.2020
Date of issue/ Date of revision	:	16.08.2019
Date of previous issue	:	30.08.2018
Version	:	5.0
Prepared by	:	Yara Chemical Compliance (YCC).

|| Indicates information that has changed from previously issued version.

Notice to reader

To the best of our knowledge, the information provided in this Safety Data Sheet is accurate as at the date of its issue. The information it contains is being given for safety guidance purposes and relates only to the specific material and uses described in it. This information does not necessarily apply to that material when combined with other material(s) or when used otherwise than as described herein, since all materials may represent unknown hazards and should be used with caution. Final determination of the suitability of any material is the sole responsibility of the user.

Annex to the extended Safety Data Sheet (eSDS) - Exposure Scenario/Safe Use Information:

Identification of the substance or mixture

Product definition : Mixture

Product name : YaraVita GRAMITREL

Exposure Scenario/Safe Use Information : Exposure Scenarios are not attached for corrosive or irritant hazards, relevant information on safe use is included in section 8. For each additional hazard resulting in classification relevant Exposure Scenarios are attached.

Annex to the extended Safety Data Sheet (eSDS) - Exposure Scenario:

Section 1 — Title

Short title of the exposure scenario	:	Yara - zinc oxide - Distribution, Formulation
Identified use name	:	Industrial distribution. Industrial USE to formulate chemical product mixtures. Industrial USE to formulate fertilisers product mixtures. Formulation by incorporating the product onto or into a matrix.
Substance supplied to that use in form of	:	In a mixture

List of use descriptors

Environmental Release Category	:	ERC02, ERC03
Market sector by type of chemical product	:	PC12
Sector of end use	:	SU03
Subsequent service life relevant for that use	:	No.

Number of the ES	:	05203-1/2016-03-30

Section 2 — Exposure controls

Contributing scenario controlling environmental exposure for:

Product characteristics	:	Solid Liquid.

Concentration of substance in mixture or article	:	> 25 %
Amounts used	:	Annual site tonnage < 5000
Frequency and duration of use	:	Continuous release
Environment factors not influenced by risk management	:	Flow rate of receiving surface water (m3/d): 18,000 Local freshwater dilution factor10 Local marine water dilution factor 100
Other conditions affecting environmental exposure	:	Indoor use Residues which cannot be recycled are disposed off as chemical waste.
Technical conditions and measures at process level (source) to prevent release	:	Formulation activity is assumed to be a predominantly enclosed process. Dust capturing and removal techniques are applied on work areas with potential dust generation. Use appropriate containment to avoid environmental contamination.
Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil	:	Specific measures are required.
Risk management measures - Air	:	Treat air emission to provide a typical removal efficiency of, > 90%, Fabric filter, Wet scrubber - particle removal
Risk management measures - Water	:	Typical on-site wastewater treatment technology provides removal efficiency of, > 90%, Chemical precipitation or sedimentation or filtration or electrolysis or reverse osmosis or ion exchange
Organizational measures to prevent/limit release from site	:	Activities should only be executed by trained/authorized personnel., Regular inspection/maintenance to prevent fugitive releases/leakage., Regular cleaning of work areas, equipment and floors., Procedures for process control should be implemented to minimise release/exposure.

Contributing scenario controlling worker exposure for:

As no toxicological hazard was identified, no human-related (worker/consumer) exposure assessment and risk characterization was performed.

Section 3 — Exposure estimation and reference to its source

Exposure estimation and reference to its source - Environment:

Exposure assessment (environment):	:	measured data
EXPOSURE ESTIMATION AND REFERENCE TO ITS SOURCE	:	See Section 8 in SDS, PNEC. Predicted exposures are not expected to exceed the PNEC when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

Contributing scenario	Annual site tonnage	Release rate	Protection target	Exposure estimate (PEC)	RCR	Remark
ERC02, ERC03	5000		Water	3,4 µg/l	0.16	[1]
ERC02, ERC03	5000		Sediment	45 mg/kg dwt	0.19	[1]
ERC02, ERC03	5000		Soil	41 mg/kg dwt	0.39	[1]
ERC02, ERC03	5000		Sewage Treatment Plant.	0 mg/l	0	[1]

[1] Calculated as Zn

Section 4 — GUIDANCE TO DU TO EVALUATE WHETHER HE WORKS INSIDE THE BOUNDARIES SET BY THE ES

Environment	:	Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures., Measure or calculate local exposure to assess risk. See tools on www.reach-zinc.eu/
Health	:	Not applicable.

Abbreviations and acronyms

Environmental Release Category	:	ERC02 - Formulation of preparations ERC03 - Formulation in materials
Market sector by type of chemical product	:	PC12 - Fertilizers
Sector of end use	:	SU03 - Industrial uses

Annex to the extended Safety Data Sheet (eSDS) - Exposure Scenario:

Section 1 — Title

Short title of the exposure scenario	:	Yara - zinc oxide - Professional, Fertilizer.
Identified use name	:	Professional formulation of fertiliser products. Professional USE as fertiliser at Farm - loading and spreading. Professional USE as fertiliser in Greenhouse. Professional USE as liquid fertiliser in open field (e.g. Fertigation). Professional USE as fertiliser - maintenance of equipment.
Substance supplied to that use in form of	:	In a mixture

List of use descriptors

Environmental Release Category	:	ERC08b
Market sector by type of chemical product	:	PC12
Sector of end use	:	SU01, SU10, SU22
Subsequent service life relevant for that use	:	No.

Number of the ES	:	05240-1/2016-04-05

Section 2 — Exposure controls

Contributing scenario controlling environmental exposure for:

Product characteristics	:	Solid Liquid.
Concentration of substance in mixture or article	:	< 40 %
Amounts used	:	Annual site tonnage 100
Frequency and duration of use	:	Continuous release
Environment factors not influenced by risk management	:	Flow rate of receiving surface water (m3/d): 18,000 Local freshwater dilution factor10 Local marine water dilution factor 100
Other conditions affecting environmental exposure	:	Indoor use Residues which cannot be recycled are disposed off as chemical waste.
Technical conditions and measures at process level (source) to prevent release	:	If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. Use appropriate containment to avoid environmental contamination.
Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil	:	> 100 tonnes/year: Specific measures are required.
Risk management measures - Air	:	Treat air emission to provide a typical removal efficiency of, > 90%, Fabric filter, Wet scrubber - particle removal
Risk management measures - Water	:	Typical on-site wastewater treatment technology provides removal efficiency of, > 90%, Chemical precipitation or sedimentation or filtration or electrolysis or reverse osmosis or ion exchange

Organizational measures to prevent/limit release from site	:	Activities should only be executed by trained/authorized personnel., Regular inspection/maintenance to prevent fugitive releases/leakage., Regular cleaning of work areas, equipment and floors., Procedures for process control should be implemented to minimise release/exposure.

Contributing scenario controlling worker exposure for:

As no toxicological hazard was identified, no human-related (worker/consumer) exposure assessment and risk characterization was performed.

Section 3 — Exposure estimation and reference to its source

Exposure estimation and reference to its source - Environment:

Exposure assessment (environment):	:	EUSES
EXPOSURE ESTIMATION AND REFERENCE TO ITS SOURCE	:	See Section 8 in SDS, PNEC. Predicted exposures are not expected to exceed the PNEC when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

Contributing scenario	Annual site tonnage	Release rate	Protection target	Exposure estimate (PEC)	RCR	Remark
ERC08b	100	0.02 %	Water	5,1 µg/l	0.25	[1], [2], [3]
ERC08b	100	0.02 %	Sediment	231 mg/kg dwt	0.98	[1], [2], [3]
ERC08b	100	0.02 %	Soil	41 mg/kg dwt	0.39	[1], [2], [3]
ERC08b	100	0.02 %	Sewage Treatment Plant.	0,046 mg/l	0.435	[1], [2], [3]

[1] Calculated as Zn

[2] PECs include the regional PEC

[3] Release factor to water

Section 4 — GUIDANCE TO DU TO EVALUATE WHETHER HE WORKS INSIDE THE BOUNDARIES SET BY THE ES

Environment	:	Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures., Measure or calculate local exposure to assess risk. See tools on www.reach-zinc.eu/
Health	:	Not applicable.

Abbreviations and acronyms

Environmental Release Category	:	ERC08b - Wide dispersive indoor use of reactive substances in open systems
Market sector by type of chemical product	:	PC12 - Fertilizers
Sector of end use	:	SU01 - Agriculture, forestry, fishery SU10 - Formulation [mixing] of preparations and/or re-packaging (excluding alloys) SU22 - Professional uses

Annex to the extended Safety Data Sheet (eSDS) - Exposure Scenario:

Section 1 — Title

Short title of the exposure scenario	:	Yara - dicopper oxide - Distribution, Formulation
Identified use name	:	Industrial distribution. Industrial USE to formulate chemical product mixtures. Industrial USE to formulate fertilisers product mixtures.
Substance supplied to that use in form of	:	In a mixture

List of use descriptors

Environmental Release Category	:	ERC02
Market sector by type of chemical product	:	PC12
Subsequent service life relevant for that use	:	No.

Number of the ES	:	00000000557507072016

Section 2 — Exposure controls

Contributing scenario controlling environmental exposure for:

Product characteristics	:	Liquid.
Concentration of substance in mixture or article	:	< 10 %
Frequency and duration of use	:	Continuous release
Environment factors not influenced by risk management	:	Size of municipal sewage system/treatment plant Flow rate of receiving surface water (m3/d): 18,000 Local freshwater dilution factor10 Local marine water dilution factor 10
Other conditions affecting environmental exposure	:	All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments.
Emission days		365
Release fraction to air from process (initial release prior to RMM)		**ERC02:** 0.4 %
Release fraction to wastewater from process (initial release prior to RMM)		**ERC02:** 2 %

Release fraction to soil from process (initial release prior to RMM)		**ERC02:** 0 %
Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil	:	Size of industrial sewage treatment plant (m3/d) 2000 m³/day
Organizational measures to prevent/limit release from site	:	Regular inspection/maintenance to prevent fugitive releases/leakage., Regular cleaning of work areas, equipment and floors., Activities should only be executed by trained/authorized personnel., Procedures for process control should be implemented to minimise release/exposure.
Conditions and measures related to sewage treatment plant	:	Size of municipal sewage system/treatment plant (m3/d) 2,000

Section 3 — Exposure estimation and reference to its source

Exposure estimation and reference to its source - Environment:

Exposure assessment (environment):	:	EUSES

Contributing scenario	Annual site tonnage	Release rate	Protection target	Exposure estimate (PEC)	RCR	Remark
ERC02		2 %	Water	0,6174 kg/day		[1], [3]
ERC02		2 %	Water	0,8575 kg/day		[2], [3]

[1] Assumed on-site sewage treatment plant flow

[2] Conditions and measures related to sewage treatment plant

[3] Cu Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal RCR < 1

Exposure estimation and reference to its source - Workers:

EXPOSURE ESTIMATION AND REFERENCE TO ITS	:	As no toxicological hazard was identified, no human-related (worker/consumer) exposure assessment and risk

SOURCE	characterization was performed.

Section 4 — GUIDANCE TO DU TO EVALUATE WHETHER HE WORKS INSIDE THE BOUNDARIES SET BY THE ES

Environment	:	Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures., Scaling tool, scalable parameters and RCR is given in section 3.
Health	:	Refer to special instructions/safety data sheet., No additional risk management measures required.

Abbreviations and acronyms

Environmental Release Category	:	ERC02 - Formulation of preparations
Market sector by type of chemical product	:	PC12 - Fertilizers

Annex to the extended Safety Data Sheet (eSDS) - Exposure Scenario:

Section 1 — Title

Short title of the exposure scenario	:	Yara - dicopper oxide - Professional, Fertilizer.
Identified use(s) to that use in form of	:	Professional formulation of fertiliser products. Professional USE as fertiliser in Greenhouse. Professional USE as liquid fertiliser in open field (e.g. Fertigation). Professional USE as fertiliser - maintenance of equipment.

List of use descriptors

Environmental Release Category	:	ERC08b, ERC08e
Market sector by type of chemical product	:	PC12
Subsequent service life relevant for that use	:	No.

Number of the ES	:	00000000606705122016

Section 2 — Exposure controls

Contributing scenario controlling environmental exposure for:

Product characteristics	:	Liquid.
Concentration of substance in mixture or article	:	< 10 %
Frequency and duration of use	:	Continuous release
Environment factors not influenced by risk management	:	Flow rate of receiving surface water (m3/d): 18.000 Local freshwater dilution factor10 Local marine water dilution factor 10
Technical conditions and measures at process level (source) to prevent release	:	Observe use instructions.
Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil	:	Professional and consumer product use with limited or no technical control of emission
Organizational measures to prevent/limit release from site	:	Activities should only be executed by trained/authorized personnel., Procedures for process control should be implemented to minimise release/exposure.

Section 3 — Exposure estimation and reference to its source

Exposure estimation and reference to its source - Environment:

Exposure assessment (environment): : EUSES

Contributing scenario	Annual site tonnage	Release rate	Protection target	Exposure estimate (PEC)	RCR	Remark
ERC08b, ERC08e			Freshwater	0,0029 mg/l		[1], [2]
ERC08b, ERC08e			Freshwater	0,0078 mg/l	1	[1], [3]
ERC08b, ERC08e			Freshwater sediment	0 mg/kg dry weight		[1], [2]
ERC08b, ERC08e			Freshwater sediment	87 mg/kg dry weight	1	[1], [3]
ERC08b, ERC08e			Marine water	0,0011 mg/l		[1], [2]
ERC08b, ERC08e			Marine water	0,0056 mg/l	1	[1], [3]
ERC08b, ERC08e			Marine sediment	16,1 mg/kg dry weight		[1], [2]
ERC08b, ERC08e			Marine sediment	676 mg/kg dry weight	1	[1], [3]
ERC08b, ERC08e			Soil	24,4 mg/kg dry weight		[1], [2]
ERC08b, ERC08e			Soil	64,6 mg/kg dry weight	1	[1], [3]

[1] Cu

[2] Background

[3] Maximum allowable concentrations

Exposure estimation and reference to its source - Workers:

EXPOSURE ESTIMATION AND REFERENCE TO ITS SOURCE : As no toxicological hazard was identified, no human-related (worker/consumer) exposure assessment and risk characterization was performed.

Section 4 — GUIDANCE TO DU TO EVALUATE WHETHER HE WORKS INSIDE THE BOUNDARIES SET BY THE ES

Environment	:	The product is not expected to harm the environment when used properly according to directions., No additional risk management measures required.
Health	:	Refer to special instructions/safety data sheet., No additional risk management measures required.

Abbreviations and acronyms

Environmental Release Category	:	ERC08b - Wide dispersive indoor use of reactive substances in open systems ERC08e - Wide dispersive outdoor use of reactive substances in open systems
Market sector by type of chemical product	:	PC12 - Fertilizers