

VALAGRO SDS according to Regulation (EU) N. 2015/830
Revision date: 13/09/2018 version number: 2.0 version replaced: 1.0_ 28/07/2015
Product: Brexil Duo
Code: 12496
Print Date: 13/09/2018

SAFETY DATA SHEET

Brexil Duo

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

1.1. Product Identifier

Mixture identification:

Trade name: Brexil Duo

Trade code: 12496

1.2. Relevant identified uses of the substance/mixture and uses advised against

Recommended use:

Fertilizer

1.3. Details of the supplier of the safety data sheet

Company:

VALAGRO Spa

Via Cagliari, 1 Zona Industriale

66041 Atessa (CH) ITALY

Tel. (+39) 08728811 Fax (+39) 0872881382

www.valagro.com

Competent person responsible for the safety data sheet:

regulatory@valagro.com


1.4. Emergency telephone number


VALAGRO SPA - Telephone (+39) 0872 8811; Telefax number. (+39) 0872 881382 (Monday to Friday from 8:30 to 13:00 and 14:00 to 17.30 (GMT+1))

SECTION 2. HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture

EC regulation criteria 1272/2008 (CLP):

 Causes serious eye damage

 Aquatic Chronic 2, Toxic to aquatic life with long lasting effects.

Adverse physicochemical, human health and environmental effects:

Avoid the contact with eyes, skin and ingestion. High concentrations of dust in the air may cause irritation of the nose and of respiratory tract

If the product is involved in a fire, the fumes of the thermal decomposition are very toxic (carbon oxides (CO_x), nitrogen oxides (NO_x), sulfur oxides (SO_x), metal oxides)

Nitrogen oxides (NO_x) produced by heating the product at high temperatures may cause pulmonary edema.

2.2. Label elements

Symbols:



Danger

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Hazard statements:

H318 Causes serious eye damage

H411 Toxic to aquatic life with long lasting effects.

Precautionary statements:

P273 Avoid release to the environment.

P280 Wear protective gloves/ safety goggles and face shield

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

P391 Collect spillage.

P501 Dispose of contents/container in accordance with applicable regulations.

Contents:

Calcium formate

Special provisions according to Annex XVII of REACH and subsequent amendments:

None

2.3. Other hazards

vPvB Substances: None - PBT Substances: None

Other Hazards:none identified













SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1. Substances

N.A.

3.2. Mixtures

Hazardous components within the meaning of the CLP regulation and related classification:

Qty	Name	Ident. Number	Classification
>= 40% - < 50%	Calcium formate	Index number: N.A. CAS: 544-17-2 EC: 208-863-7 REACH N°:01-2119486476-24-xxxx	 3.3/1 Eye Dam. 1 H318
< 1%	Zinc sulphate	Index number: 030-006-00-9 CAS: 7733-02-0 EC: 231-793-3 REACH N°:01-2119474684-27-xxxx	 3.3/1 Eye Dam. 1 H318  4.1/A1 Aquatic Acute 1 H400  4.1/C1 Aquatic Chronic 1 H410  3.1/4/Oral Acute Tox. 4 H302 M factor acute = 1 M factor chronic = 1
< 1%	Manganese sulphate	Index number: 030-006-00-9 CAS: 7733-02-0 EC: 231-793-3 REACH N°: 01-2119456624-35-xxxx	 3.3/1 Eye Dam. 1 H318  3.9/2 STOT RE 2 H373  4.1/C2 Aquatic Chronic 2 H411
< 1%	Copper sulphate	Index number: 029-004-00-0 CAS: 7758-98-7 EC: 231-847-6 REACH N°: 01-2119520566-40-xxxx	 3.3/2 Eye Irrit. 2 H319  3.2/2 Skin Irrit. 2 H315  4.1/A1 Aquatic Acute 1 H400  4.1/C1 Aquatic Chronic 1 H410


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			 3.1/4/Oral Acute Tox. 4 H302 M factor acute = 10
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For full text of H-statements: see SECTION 16

SECTION 4. FIRST AID MEASURES

4.1. Description of first aid measures

Personal protective equipment for first aid responders is recommended: gloves, safety goggles, protective clothing.

In case of skin contact:

Immediately take off all contaminated clothing.

Areas of the body that have - or are only even suspected of having - come into contact with the product must be rinsed immediately with plenty of running water and possibly with soap.

Wash thoroughly the body (shower or bath).

Remove contaminated clothing immediately and dispose off safely.

After contact with skin, wash immediately with soap and plenty of water.

If irritation develops, get medical attention.

In case of eyes contact:

After contact with the eyes, rinse with water with the eyelids open for a sufficient length of time, then consult an ophthalmologist immediately.

Protect uninjured eye.

In case of Ingestion:

Never give anything by mouth to an unconscious person; if person is conscious rinse mouth with water and then give plenty of water to drink. Do not induce vomiting unless instructed to do so by medical personnel. OBTAIN A MEDICAL EXAMINATION IMMEDIATELY.

In case of Inhalation:

Remove casualty to fresh air and keep warm and at rest.

4.2. Most important symptoms and effects, both acute and delayed

No data available for the mixture.

Possible symptoms that may occur:

Inhalation: may cause irritation to the respiratory tract

Symptoms: cough, shortness of breath

Ingestion:

The product dissolved in water or in presence of moisture, cause an acid reaction and if swallowed can cause irritation and burns of the mouth, throat and digestive tract.

Symptoms: vomiting, abdominal pain, gastrointestinal disorders

Contact with skin:

May cause irritation to the skin

Symptoms: redness, itching, pain.

Contact with eyes:

causes serious eye damage

Symptoms include pain and redness

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

In case of accident or unwellness, seek medical advice immediately (show directions for use or safety data sheet if possible).

Treatment:

Seek medical advice

SECTION 5. FIRE-FIGHTING MEASURES

5.1. Extinguishing media

Suitable extinguishing media:

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Water spray.

Foam

Carbon dioxide (CO₂).

Powder

Extinguishing media which must not be used for safety reasons:

None in particular.

5.2. Special hazards arising from the substance or mixture

Do not inhale explosion and combustion gases.

Burning produces smoke containing carbon oxides, nitrogen oxides, sulfur oxides, metal oxides

5.3. Advice for fire-fighters

Use suitable breathing apparatus, protective clothing, eye protection and gloves resistant to chemicals according to EN469.

Collect contaminated fire extinguishing water separately. This must not be discharged into drains.

Move undamaged containers from immediate hazard area if it can be done safely.

In case of gas escape or of entry into waterways, soil or drains, inform the responsible authorities

SECTION 6. ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures

No action shall be taken involving any personal risk or without suitable training.

- For non-emergency personnel:

Wear protective clothes giving a total skin protection, gloves, safety glasses and dust mask

Keep away from the affected area people not involved in the emergency intervention.

Ensure adequate ventilation, move people in a safe place.

Alert the internal emergency team.

- For emergency responders:

Wear protective clothes giving a total skin protection, PVC gloves, safety glasses and mask with filter P2.

Ensure adequate ventilation, move people in a safe place.

See protective measures under point 7 and 8.

Avoid dust generation

Dusts at sufficient concentrations can form explosive mixtures with air

Avoid any accumulation of electrostatic charge which may create a hazardous condition and cause

6.2. Environmental precautions

Do not allow to enter into soil/subsoil. Do not allow to enter into surface water or drains.

Retain contaminated washing water and dispose it in landfill approved;

If possible, collect in clean plastic containers labeled and reuse as fertilizer.

In case of gas escape or of entry into waterways, soil or drains, inform the responsible authorities.

Suitable material for taking up: absorbing material, soil, sand.

6.3. Methods and material for containment and cleaning up

Collect the product for example using shovel and broom

Avoid raising dust

Wash with plenty of water, contain the spill with absorbent material, earth, sand.

6.4. Reference to other sections

See also section 8 and 13

SECTION 7. HANDLING AND STORAGE

7.1. Precautions for safe handling

Avoid contact with skin and eyes, inhalation of powder.

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Don't use empty container before they have been cleaned.

Before making transfer operations, assure that there aren't any incompatible material residuals in the containers.

Contaminated clothing should be changed before entering eating areas.

Do not eat or drink while working.

See also section 8 for recommended protective equipment.

7.2. Conditions for safe storage, including any incompatibilities

Keep in original containers tightly closed in a well-ventilated place far from humidity, heat and ignition sources. Avoid exposure to direct sunlight

Keep away from food, drink and feed.

Incompatible materials:

Strong acids and bases, oxidizing and reducing agents.

Instructions as regards storage premises:

Adequately ventilated, cool and dry premises

7.3. Specific end use(s)

N.A.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control parameters

- Calcium Formate CAS: 544-17-2 ; EC: 208-863-7

DNEL

oral:

Long-term systemic effects DNEL = 23.9 mg/kg bw/d (consumers)

skin:

DNEL acute local effects = 16.7 mg / cm² (workers)

= 8.3 mg / cm² (consumers)

DNEL acute systemic = 4780 mg / kg bw / d (workers)

= 2390 mg / kg bw / d (consumers)

DNEL long-term local effects = 8.3 mg / cm² (consumers)

DNEL long-term systemic effects = 4780 mg / kg bw / d (workers)

= 2390 mg / kg bw / d (consumers)

inhalation:

DNEL acute systemic = 337 mg / m³ (workers)

= 83.2 mg / m³ (consumers)

DNEL long-term systemic effects = 337 mg / m³ (workers)

= 83.2 mg / m³ (consumers)

PNEC

PNEC fresh water = 2 mg/l

PNEC intermittent release = 10 mg/l

PNEC seawater = 0.2 mg/l

PNEC sediment (FW) = 13.4 mg/kg dw

PNEC sediment (MW) = 1.34 mg/kg dw

- manganese sulphate CAS: 7785-87-7, EC: 232-089-9

Exposure limit Manganese (Mn) TWA: 0.2 mg/m³ inorganic compounds

Critical effect: central nervous system

Workers:

DNEL skin = 0.00414 mg / kg / day

DNEL inhalation = 0.2 mg / kg / day

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Population:

DNEL skin = 0.0021 mg / kg / day

DNEL inhalation = 0.043 mg / m³

Environment:

PNEC water (fresh water) = 0.0128 mg / l

PNEC water (sea water) = 0.0004 mg / l

PNEC water (intermittent emissions) = 0.03 mg / l

PNEC STP = 56 mg / l

PNEC sediment (fresh water) = 0.0114 mg / kg dw sediment

PNEC sediment (sea water) = 0.00114 mg / kg dw sediment

PNEC soil = 25.1 mg / kg soil dw

- zinc sulphate CAS: 7446-19-7, EC: 231-793-3
Exposure limit Zinc (Zn)

soluble zinc compounds

Country/organisation	8 hour-TWA mg/m ³	15 min-STEEL mg/m ³	References
USA	1	2	ACGIH (1991)
The Netherlands	1		SZW (1997)
UK	1	2 ^{a)}	HSE (1998)
Sweden	1 ^{b)}		National Board of Occupational Safety and Health, Sweden (1993)
Denmark	0.5		Arbejdstilsynet, 1992

- a) This value is a 10 minutes-STEEL

- b) This TWA is determined for dust

DNELs and PNECs

DNELs

• **Oral**

○ DNEL_{oral soluble Zn} = 50 mg Zn/day (i.e., 0.83 mg Zn/kg bw/day);

○ DNEL_{oral insoluble Zn} = 50 mg Zn/day (i.e., 0.83 mg Zn/kg bw/day);

• **Dermal**

○ DNEL_{dermal soluble Zn} = 500 mg Zn/day (i.e., 8.3 mg Zn/kg bw/day);

○ DNEL_{dermal insoluble Zn} = 5000 mg Zn/day (i.e., 83 mg Zn/kg bw/day);

• **Inhalation - Worker**

○ DNEL_{inhal soluble Zn (worker)} = 1 mg Zn/m³;

○ DNEL_{inhal insoluble Zn (worker)} = 5 mg Zn/m³;

• **Inhalation - Consumer**

○ DNEL_{inhal soluble Zn (consumer)} = 1.3 mg Zn/m³;

○ DNEL_{inhal insoluble Zn (consumer)} = 2.5 mg Zn/m³;

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PNECs derived for the zinc ion

Compartment (Environment)	PNEC value for Zn ion
Freshwater	20.6* µg/L
Saltwater	6.1* µg/L
STP	52 µg/L
Freshwater sediment	117.8* mg/kg sediment d.w. A generic bioavailability factor of 0.5 is applied by default: PNEC _{bioav} : 235.6 mg/kg sediment d.w.
Saltwater sediment	56.5* mg/kg sediment d.w. A generic bioavailability factor of 0.5 is applied by default: PNEC _{bioav} : 113 mg/kg sediment d.w.
Soil	35.6* mg/kg soil d.w. A generic bioavailability/ageing factor of 3 is applied by default: PNEC _{bioav} : 106.8 mg/kg soil d.w.
Oral	No potential for bioaccumulation

*added value

- copper sulphate CAS: 7758-98-7, EC: 231-847-6
- Exposure limit Copper (Cu) TWA 1 mg/m³ dust or mist
0.2 mg/m³ fumes
- Critical effect: metal fume fever and gastrointestinal irritation

DN(M)EL:

Workers - skin

DNEL (Derived No Effect Level) for dry copper compounds - long-term systemic effects

= 137 mg/kg bw/day

DNEL (Derived No Effect Level) for copper compounds in solution or slurry- long-term systemic effects

13.7g/kg = body weight / day

Consumers:

Oral - long-term effects:

DNEL 0.041 mg/kg bw/day

NOAEL: 16.00 mg/kg bw/day (based on AF100)

PNECs:

PNEC STP sewage treatment plants = 230 µg/l

PNEC freshwater = 7,8 µg/l

PNEC marine water = 5,2 µg/l

PNEC sediment freshwater = 87 mg/Kg

PNEC sediment marine water = 676 mg/Kg

PNEC soil = 65 mg/Kg

ACGIH (2003) : recommended value inhalable dust: TLV/TWA: 10 mg/m³

ACGIH (2003) : recommended value breathable dust: TLV/TWA: 3 mg/m³

8.2. Exposure controls

The personal protective equipment must be compliant to the regulation UNI - EN in force

Eye protection:

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Use close fitting safety goggles according to the standard EN 166, don't use eye lens.

Protection for skin:

Wear protective clothing.

Protection for hands:

Nitrile gloves with long cuffs according to the EN 374.

Respiratory protection:

In case of dust generation, use anti-powder mask with P2 filters according to the EN 149:2001.

The powder exposition limit must be respected

Thermal Hazards:

None

Environmental exposure controls:

None

Prevent the contamination of soil, surface water or groundwater

Appropriate engineering controls:

None

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

Appearance and colour: brown microgranules

Odour: coffee

Odour threshold: N.A.

pH 1% at 20°C: 7.4

Melting point / freezing point: N.A.

Initial boiling point and boiling range: not applicable, solid

Flash point: not applicable, solid

Evaporation rate: not applicable, solid.

Solid/gas flammability: not applicable, the product doesn't contain any flammable substance

Upper/lower flammability or explosive limits: not applicable, the product doesn't contain any flammable or explosive substance

Vapour pressure: not applicable, solid

Vapour density: not applicable, solid

Apparent density: 0,5 – 0,6 Kg/dm³

Solubility in water: 100 g/L at 20°C

Solubility in oil: N.A.

Partition coefficient (n-octanol/water): N.A.

Auto-ignition temperature: N.A.

Decomposition temperature: N.A.

Viscosity: not applicable, solid

Explosive properties: not applicable, the product doesn't contain any explosive substance

Oxidizing properties: not applicable, the product doesn't contain any oxidizing substance

9.2. Other information

Miscibility: N.A.

Fat Solubility: N.A.

Conductivity: N.A.

Substance Groups relevant properties N.A.

SECTION 10. STABILITY AND REACTIVITY

10.1. Reactivity

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- Stable under normal conditions of storage
- 10.2. Chemical stability
 - Stable under normal conditions of storage
- 10.3. Possibility of hazardous reactions
 - The product can release gaseous ammonia if in contact with alkaline substances such as lime
- 10.4. Conditions to avoid
 - Avoid heating the product at high temperatures
 - Avoid dust generation.
 - Dusts at sufficient concentrations can form explosive mixtures with air
 - Avoid any accumulation of electrostatic charge which may create a hazardous condition and cause an ignition.
- 10.5. Incompatible materials
 - Avoid the contact with strong acids and bases, oxidizing and reducing agents.
 - The product can release gaseous ammonia if in contact with alkaline substances such as lime
- 10.6. Hazardous decomposition products
 - Do not decompose when used for intended uses.

SECTION 11. TOXICOLOGICAL INFORMATION

11.1. Information on toxicological effects

Toxicological information of the main substances in the mixture:

a) acute toxicity

- Calcium Formate CAS: 544-17-2 ; EC: 208-863-7
 LD50 Oral = 3050 mg / kg (rat) (OECD 401)
 LD50 Dermal > 2000 mg / kg (rat) (OECD 402)
 LC50 / 4h Inhalation > 0.67 mg / l (rat) (EPA OTS 798.1150)

Repeated dose toxicity:

- NOAEL / 28d oral: 1000 mg kg bw / d (rat) (OECD 407)
- NOAEL / 90d oral 3000 mg / kg bw / d (rat) (OECD 408)

- manganese sulphate CAS: 7785-87-7, EC: 232-089-9
 LC50 Inhalation > 4.98 mg/l
 LD50 Oral = 2150 mg/Kg bw
 Skin: Manganese sulphate, absorption through skin is unlikely

- zinc sulphate CAS: 7446-19-7, EC: 231-793-3

Product	Results	Species	Doses	Ref.
Zinc sulphate monohydrate hexahydrate heptahydrate	LD50 Oral	Rata	574 to 2,949 862 to 4,429 920 to 4,725 mg/kg	Litton Bionetics, 1974 Courtois et al., 1978
Zinc sulphate	LD50 Dermal	Rat	>2000 mg/kg	Van Huygevoort (1999a)

- copper sulphate CAS: 7758-98-7, EC: 231-847-6
 LD50 Oral: 482 mg / kg bw (OECD 401)
 LD50 Dermal: > 2000 mg / kg bw (OECD 402)
 LC50 Inhalation: N.A.

b) skin corrosion/irritation

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- Calcium Formate CAS: 544-17-2 ; EC: 208-863-7

Skin: No irritant effect

lightly irritating to the respiratory system

- manganese sulphate Index number: 025-003-00-4, CAS: 7785-87-7, EC: 232-089-9

Not irritating

- zinc sulphate Index number: 030-006-00-9, CAS: 7733-02-0, EC: 231-793-3

Not irritating (Van Huygevoort, 1999b; Lansdown, 1991)

- copper sulphate Index number: 029-004-00-0, CAS: 7758-98-7, EC: 231-847-6

Not irritating (rabbit)

c) serious eye damage/irritation

- Calcium Formate CAS: 544-17-2 ; EC: 208-863-7

Strong irritant with the danger of severe eye injury.

- manganese sulphate CAS: 7785-87-7, EC: 232-089-9

In vivo test on rabbit OECD 405: Causes serious eye damage - Ref. Pooles A (2009)

- zinc sulphate CAS: 7446-19-7, EC: 231-793-3

not irritant (Van Huygevoort, 1999b; Lansdown, 1991)

- copper sulphate Index number: 029-004-00-0, CAS: 7758-98-7, EC: 231-847-6

strong irritant (rabbit)

d) respiratory or skin sensitisation

- Calcium Formate CAS: 544-17-2 ; EC: 208-863-7

Inhalation: N.A.

Skin: no sensitizing (OECD 406).

- manganese sulphate CAS: 7785-87-7, EC: 232-089-9

Skin: no sensitizing according to OECD 429

Respiratory system: N.A.

- zinc sulphate CAS: 7446-19-7, EC: 231-793-3

no sensitizing effect known (Van Huygevoort, 1999i, Ikarashi et al, 1992)

- copper sulphate CAS: 7758-98-7, EC: 231-847-6

Not sensitizing

e) germ cell mutagenicity

- Calcium Formate CAS: 544-17-2 ; EC: 208-863-7

Test bacterial reverse mutation(OECD 471) : not mutagenic

Test mammalian cells (OECD 476): not mutagenic

Test in vivo (OECD 477): not mutagenic

- manganese sulphate CAS: 7785-87-7, EC: 232-089-9

Result: negative (read-across results in vivo and in vitro test Manganese chloride)

- zinc sulphate CAS: 7446-19-7, EC: 231-793-3

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No biologically relevant genotoxic activity (based on cross-reading between Zn compounds; no classification for mutagenicity required) (Chemical Safety report (CSR) zinc sulphate. 2010)

- copper sulphate CAS: 7758-98-7, EC: 231-847-6
not classified as mutagenic

f) carcinogenicity

- Calcium Formate CAS: 544-17-2 ; EC: 208-863-7
Animal studies have not shown any carcinogenic potential.
NOAEL Oral = 2000 mg / kg bw / d (rat) (OECD 453)

- manganese sulphate CAS: 7785-87-7, EC: 232-089-9
not carcinogenic

- zinc sulphate CAS: 7446-19-7, EC: 231-793-3
not carcinogenic

- copper sulphate CAS: 7758-98-7, EC: 231-847-6
not carcinogenic

g) reproductive toxicity

- Calcium Formate CAS: 544-17-2 ; EC: 208-863-7
NOAEL Oral development = 956 mg / kg bw / day (rat) (OECD 414)
NOAEL Fertility = 956 mg/ g bw/day (rat) (OECD 414)

- manganese sulphate CAS: 7785-87-7, EC: 232-089-9
not classified

- zinc sulphate CAS: 7446-19-7, EC: 231-793-3
not classified

- copper sulphate CAS: 7758-98-7, EC: 231-847-6
not classified (OECD 416)

h) STOT-single exposure

- Calcium Formate CAS: 544-17-2 ; EC: 208-863-7
N.A.

- manganese sulphate CAS: 7785-87-7, EC: 232-089-9
not classified

- zinc sulphate CAS: 7446-19-7, EC: 231-793-3
not classified

- copper sulphate CAS: 7758-98-7, EC: 231-847-6
not classified (OECD 416)

i) STOT-repeated exposure

- Calcium Formate CAS: 544-17-2 ; EC: 208-863-7
N.A.

- manganese sulphate CAS: 7785-87-7, EC: 232-089-9

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STOT RE 2 May cause damage to the brain through prolonged or repeated exposure by inhalation.

- zinc sulphate CAS: 7446-19-7, EC: 231-793-3
not classified

- copper sulphate CAS: 7758-98-7, EC: 231-847-6
not classified

j) aspiration hazard.

- Calcium Formate CAS: 544-17-2 ; EC: 208-863-7
N.A.

- manganese sulphate CAS: 7785-87-7, EC: 232-089-9

STOT RE 2 May cause damage to the brain through prolonged or repeated exposure by inhalation.

- zinc sulphate CAS: 7446-19-7, EC: 231-793-3
N.A.

- copper sulphate CAS: 7758-98-7, EC: 231-847-6
N.A.

No data available for the mixture.

Possible symptoms that may occur:

Inhalation: may cause irritation to the respiratory tract

Symptoms: cough, shortness of breath

Ingestion:

The product dissolved in water or in presence of moisture, cause an acid reaction and if swallowed can cause irritation and burns of the mouth, throat and digestive tract.

Symptoms: vomiting, abdominal pain, gastrointestinal disorders

Contact with skin:

May cause irritation to the skin

Symptoms: redness, itching, pain.

Contact with eyes:

Causes eye irritation

Symptoms include pain and redness

SECTION 12. ECOLOGICAL INFORMATION

12.1. Toxicity

Adopt good working practices, so that the product is not released into the environment.

Toxic to aquatic life with long lasting effects.

- Calcium Formate CAS: 544-17-2 ; EC: 208-863-7
Aquatic toxicity:
Low toxicity to aquatic organisms.
EC50 > 1000 mg / l (bacterium)
EC50 / 48h > 1000 mg / l (Daphnia magna)
EC50 / 72h > 1000 mg / l (Pseudokirchnerella subcapitata)
LC0 / 48h > 1000 mg / l (Danio rerio)
- Manganese sulphate - CAS: 7785-87-7, EC: 232-089-9

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Aquatic compartment	Results	Substance	Reference
Short-term toxicity: <i>Oncorhynchus mykiss</i> Fresh water	LC50 (96 h): 14.5 mg/L Mn	Test material Manganese sulphate monohydrate	Davies PH (1980)
Long-term toxicity: <i>Oncorhynchus mykiss</i> , fresh water	NOEC (4 mo): 0.6 mg/L Mn	Test material (EC name): manganese sulphate	Davies P & Brinkman S (1994)
Short-term toxicity: <i>Daphnia magna</i> , fresh water	LC50 (48 h): 9.8 mg/L dissolved (meas. (arithm. mean)) based on: as Mn ²⁺	Test material (EC name): manganese chloride	Biesinger KE & Christensen GM (1972)
Long-term toxicity: <i>Daphnia magna</i> , salt water	LC50 (3 settimane): 5700 µg/L dissolved (meas. (arithm. mean)) based on: mortality	Test material (EC name): manganese chloride	Biesinger KE & Christensen GM (1972)
Algae: <i>Desmodesmus subspicatus</i> (algae, Growth Inhibition Test), fresh water	EC50 (72 h): 61 mg/L test mat. (nominal) based on: growth rate	Test material manganese sulphate monohydrate	Vryenhoef H (2010)

- zinc sulphate - Index: 030-006-00-9, CAS: 7733-02-0, EC No: 231-793-3
Acute aquatic toxicity
For zinc heptahydrate (a ZnSO₄·7H₂O/Zn molecular weight ratio of 4.4):
 - for pH <7: 1.82 mg Zn/l (based on 48 hr Ceriodaphnia dubia test cfr. above)
 - for pH >7-8.5: 0.60 mg Zn/l (based on 72 hr Selenastrum capricornutum test cfr. above)
 M-factor: 1
Toxicidad para los microorganismos en STP
PNEC para STP: 5,2 mg de Zn / l (Dutka et al, 1983.)
- Copper sulphate CAS: 7758-98-7, EC: 231-847-6
The reference values for soluble copper ions acute and chronic:
 - pH 5.5 to 6.5
L(E) C50 (µg Cu/l) = 25
NOEC (µg Cu/l) = 20
 - pH> 6.5 to 7.5
L (E) C50 (µg Cu/l) = 35
NOEC (µg Cu/l) = 7.4
 - pH> 7.5 to 8.5
L (E) C50 (µg Cu/l) = 29.8
NOEC (µg Cu/l) = 11.4
 - Across pH
L(E)C50 (µg Cu/l) = 34.4
NOEC (µg Cu/l) = 14.9

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AquaticPNEC:

PNEC freshwater ($\mu\text{g/l}$): 7.8 FactorAssesment = 1PNEC sea water ($\mu\text{g/l}$): 5.2 FactorAssesment = 1

PNEC intermittent water-Press: N. A. FactorAssesment = N. A.

12.2. Persistence and degradability

- Calcium Formate CAS: 544-17-2 ; EC: 208-863-7

easily biodegradable.

BOD28 86% (OECD 306)

BOD28 / COD > 75% (OECD 301)

- Manganese sulphate - CAS: 7785-87-7, EC: 232-089-9

Not relevant for inorganic substances

- zinc sulphate - Index: 030-006-00-9, CAS: 7733-02-0, EC No: 231-793-3

Not relevant for inorganic substances

- Copper sulphate CAS: 7758-98-7, EC: 231-847-6

Not relevant for inorganic substances

12.3. Bioaccumulative potential

The mixture doesn't contain any bioaccumulative component

- Calcium Formate CAS: 544-17-2 ; EC: 208-863-7

Log Pow = - 2.6 (OECD 107)

- Manganese sulphate - CAS: 7785-87-7, EC: 232-089-9

Not bioaccumulable

- zinc sulphate - Index: 030-006-00-9, CAS: 7733-02-0, EC No: 231-793-3

Not bioaccumulable

- Copper sulphate CAS: 7758-98-7, EC: 231-847-6

Not bioaccumulable

12.4. Mobility in soil

In general, the mobility in the soil of the microelements in the mixture is influenced by several factors such as pH, CO₂ concentration, redox conditions, availability of organic and inorganic

- Calcium Formate CAS: 544-17-2 ; EC: 208-863-7

Log Koc = 1.496

- Manganese sulfate CAS: 7785-87-7, EC: 232-089-9

N.A.

- Zinc sulfate CAS: 7733-02-0, EC: 231-793-3

solids-water partitioning coefficient = 158.5 l/kg (log = 2.2 value)

- Copper sulfate CAS: 7758-98-7, EC: 231-847-6

Copper is strongly bounded to various components of the soil so that the free copper is at a very low level in the soil.

12.5. Results of PBT and vPvB assessment

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vPvB Substances: None - PBT Substances: None

12.6. Other adverse effects

None Known

SECTION 13. DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

Product :Recover if possible. In so doing, comply with the local and national regulations currently in force.

Packaging: Dispose according to regulations.

SECTION 14. TRANSPORT INFORMATION



14.1. UN number

ADR-UN Number: 3077

IATA-UN Number: 3077

IMDG-UN Number: 3077

14.2. UN proper shipping name

ADR-Shipping Name: SOLID SUBSTANCE - HARMFUL FOR THE ENVIRONMENT, N.A.S. (manganese sulphate, zinc sulphate, copper sulphate)

IATA-Shipping Name: SOLID SUBSTANCE - HARMFUL FOR THE ENVIRONMENT, N.A.S. (manganese sulphate, zinc sulphate, copper sulphate)

IMDG-Shipping Name: SOLID SUBSTANCE - HARMFUL FOR THE ENVIRONMENT, N.A.S. (manganese sulphate, zinc sulphate, copper sulphate)

14.3. Transport hazard class(es)

ADR-Class: 9

ADR - Hazard identification number: 90

IATA-Class: 9

IATA-Label: no data available

IMDG-Class: 9

14.4. Packing Group

ADR-Packing Group: III

IATA-Packing group: III

IMDG-Packing group: III

14.5. Environmental hazards

ADR-Environmental Pollutant: Yes

IMDG-Marine pollutant: No

14.6. Special Precautions for User

ADR-Subsidiary risks: -

ADR-S.P.: 274 335 375 601

ADR-Codice di restrizione in galleria: (E)

IATA-Passenger Aircraft: 956

IATA-Subsidiary risks: -

IATA-Cargo Aircraft: 956

IATA-S.P.: A97 A158 A179

IATA-ERG: 9L

IMDG-EMS: F-A , S-F

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- IMDG-Subsidiary risks: -
 IMDG-Storage category: Category A
 IMDG-Storage notes: -
 14.7. Transport in bulk according to Annex II of MARPOL and the IBC Code
 Not transported in bulk

SECTION 15. REGULATORY INFORMATION

- 15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture
 Dir. 98/24/EC (Risks related to chemical agents at work)
 Dir. 2000/39/EC (Occupational exposure limit values)
 Regulation (EC) n. 1907/2006 (REACH)
 Regulation (EC) n. 1272/2008 (CLP)
 Regulation (EC) n. 790/2009 (ATP 1 CLP) and (EU) n. 758/2013
 Regulation (EU) 2015/830
 Regulation (EU) n. 286/2011 (ATP 2 CLP)
 Regulation (EU) n. 618/2012 (ATP 3 CLP)
 Regulation (EU) n. 487/2013 (ATP 4 CLP)
 Regulation (EU) n. 944/2013 (ATP 5 CLP)
 Regulation (EU) n. 605/2014 (ATP 6 CLP)
 Regulation (EU) n. 2015/1221 (ATP 7 CLP)
 Regulation (EU) n. 2016/918 (ATP 8 CLP)
 Regulation (EU) n. 2016/1179 (ATP 9 CLP)

Restrictions related to the product or the substances contained according to Annex XVII Regulation (EC) 1907/2006 (REACH) and subsequent modifications:
 None

Where applicable, refer to the following regulatory provisions :
 Directive 2012/18/EU (Seveso III)
 Regulation (EC) nr 648/2004 (detergents).
 Dir. 2004/42/EC (VOC directive)

N.A.

Provisions related to directive EU 2012/18 (Seveso III):

- 15.2. Chemical safety assessment
 No Chemical Safety Assessment has been carried out for the mixture.

SECTION 16. OTHER INFORMATION

Classification according to Regulation (EC) Nr. 1272/2008	Classification procedure
Causes serious eye damage	Calculation method
Aquatic Chronic 2, Toxic to aquatic life with long lasting effects.	Calculation method

Text of phrases referred to under heading 3:

- H318 Causes serious eye damage.
 H400 Very toxic to aquatic life.
 H410 Very toxic to aquatic life with long lasting effects.
 H302 Harmful if swallowed.
 H373 May cause damage to the brain through prolonged or repeated exposure per inhalation.
 H411 Toxic to aquatic life with long lasting effects.
 H319 Causes serious eye irritation.
 H315 Causes skin irritation.

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This document was prepared by a competent person who has received appropriate training.

Main bibliographic sources:

ECDIN - Environmental Chemicals Data and Information Network - Joint Research Centre,
Commission of the European Communities

SAX's DANGEROUS PROPERTIES OF INDUSTRIAL MATERIALS - Eight Edition - Van
Nostrand Reinold

CCNL - Appendix 1

Insert further consulted bibliography

The information contained herein is based on our state of knowledge at the above-specified date. It refers solely to the product indicated and constitutes no guarantee of particular quality.

It is the duty of the user to ensure that this information is appropriate and complete with respect to the specific use intended.

Paragraphs modified from the previous revision : all paragraphs

This MSDS cancels and replaces any preceding release.

Sections modified from previous version: all the sections

ADR:	European Agreement concerning the International Carriage of Dangerous Goods by Road.
CAS:	Chemical Abstracts Service (division of the American Chemical Society).
CLP:	Classification, Labeling, Packaging.
DNEL:	Derived No Effect Level.
EINECS:	European Inventory of Existing Commercial Chemical Substances.
GefStoffVO:	Ordinance on Hazardous Substances, Germany.
GHS:	Globally Harmonized System of Classification and Labeling of Chemicals.
IATA:	International Air Transport Association.
IATA-DGR:	Dangerous Goods Regulation by the "International Air Transport Association" (IATA).
ICAO:	International Civil Aviation Organization.
ICAO-TI:	Technical Instructions by the "International Civil Aviation Organization" (ICAO).
IMDG:	International Maritime Code for Dangerous Goods.
INCI:	International Nomenclature of Cosmetic Ingredients.
KSt:	Explosion coefficient.
LC50:	Lethal concentration, for 50 percent of test population.
LD50:	Lethal dose, for 50 percent of test population.
LTE:	Long-term exposure.
PNEC:	Predicted No Effect Concentration.
RID:	Regulation Concerning the International Transport of Dangerous Goods by Rail.
STE:	Short-term exposure.
STEL:	Short Term Exposure limit.
STOT:	Specific Target Organ Toxicity.
TLV:	Threshold Limiting Value.
TWATLV:	Threshold Limit Value for the Time Weighted Average 8 hour day. (ACGIH Standard).
WGK:	German Water Hazard Class.
N.A.:	no data available