

MSDS CMI Superflor 21% Boron Soluble Powder

(Disodium Octoborate Tetrahydrate) Review Date: 28.02.2022 S/C V09

1.1. Product identifier:

Commercial name: CMI SUPERFLOR 21% Boron Soluble Powder

• Chemical name: Disodium Octaborate Tetrahydrate

N° CAS: 12280-03-4 N° EINECS: 234-541-0

• REACH registration number: 01-2119490860-33-0004

1.2. Substance's identified relevant applications and unadvisable uses:

Advisable uses:

- Fertilizers
- Biocide substances
- Flame retardants
- Fluxes

Uses advised against:

Not specified

1.3. Supplier information from the Safety Information Sheet:

Supplier: CMI Limited

The Studio Main Street South Scarle NEWARK

Nottinghamshire

UK

NG23 7JH

Tel: +44 (0) 1636 892078 (Emergency contact - office hours)

Email: info@cmi.ltd.uk

2.1. Substance or mix classification:

Toxic for reproduction category 1B

	Classification				
Classification system	Class code and Danger category	Danger indicator code			
Regulation(U/E) N° 2015/830	Repr. 1B	H360FD			

2.1.1. Main side effects:

- Inhaling: There may be light irritation to the nose and throat if levels higher than 10 mg/m3 of Superflor 21% Boron Soluble Powder dust are inhaled.
- Eye contact: It is not irritating when used industrially.
- **Skin contact:** It does not cause irritation to uninjured skin. It may be absorbed through injured skin and may cause skin redness and flaking.
- **Ingestion:** The ingestion of large quantities (greater than 5 g) may cause nausea, vomiting and diarrhoea.
- For reproduction / development: Studies on the ingestion of high doses by various species of animals indicate that borates cause reproductive and developmental effects. A human study on the occupational exposure to borate dust did not show side effects on reproduction.
- **Potential ecological effects:** Great quantities of Superflor 21% Boron Soluble Powder may be harmful to plants and other species. Therefore, environmental emissions should be reduced to a minimum.

2.2. Label elements:



H360FD: May damage fertility or the unborn child. P201: Obtain special instructions before use.

P202: Do not handle until all safety precautions have been read and understood.

P281: Use personal protective equipment as required.

P308 + P313: IF exposed or concerned get medical advice/attention.

P405: Store locked up.

P501: Dispose of contents/container in accordance with local / regional / national /

international regulations

2.3. Other dangers:

PBT or vPvB: In accordance with annex XIII of REACH, "Criteria for the identification of Persistent, Bioaccumulative and Toxic substances (PBT-substances), and very Persistent and very Bio-accumulative substances (vPvB-substances)", it does not apply to inorganic substances such as Superflor 21% Boron Soluble Powder.

3.1. Substances:

Commercial name: Superflor 21% Boron Soluble Powder
 Chemical name: Disodium Octaborate Tetrahydrate

N° CAS: 12280-03-4N° EINECS: 234-541-0

• **REACH registration number:** 01-2119490860-33-0004

Molecular formula: Na₂B₈O₁₃.4H₂O
 Molecular weight: 412.52g/mol

• Concentration: 99.20% to 101.00% de Disodium Octaborate Tetrahydrate

• Family: Inorganic Borate

4.1. First aid description:

In the case of manifest or suspected exposure: consult a doctor.

- **Inhaling:** If there is a case of symptoms such as nose or throat irritations, provide clear air and rest. If respiration is irregular or has stopped, proceed with artificial respiration and seek medical advice.
- **Eye contact**: Wash eyes with abundant water and clean for 15 minutes by keeping eyes wide open. If irritation persists for more than 30 minutes, seek medical advice.
- Skin contact: Undetermined.

• **Ingestion:** Swallowing small quantities (a teaspoonful) does not cause any harm to healthy adults. If great quantities are swallowed, drink two glasses of water and seek medical advice.

4.2. Main symptoms and acute and delayed effects:

None.

4.3. Medical attention indication and special treatment which need to be undertaken immediately:

In the case of ingestion of Superflor 21% Boron Soluble Powder smaller than 5 g in adults, only observation is necessary.

In the case of ingestion of quantities greater than 5 g, maintain renal function and administer liquids abundantly. Gastric irrigation is only recommended to symptomatic patients. Haemodialysis should be reserved for acute massive ingestion or for patients suffering from renal failure. Urine and blood tests are only useful to keep a record of the exposure and should not be used to evaluate intoxication severity or as a guide for treatment. (see section 11)

5.1. Extinguishing means:

To extinguish fire, use the fire fighting measures appropriate to the local and environmental circumstances.

5.2. Specific dangers deriving from the substance or mix:

None, non-flammable product, non-combusting, non-explosive.

5.3. Recommendations for fire fighters:

Personal protection equipment: overall, boots, gloves, eye protection, breather.

NOTE: The product is in itself a flame retardant.

6.1 Personal precautions, protection equipment and emergency procedures

6.1.1. Personal precautions:

- Avoid making dust. In the case of prolonged exposure or high levels of dust in the air, use a personal breather in accordance to the national laws.
- Avoid inhaling dust.
- Assure an adequate ventilation

6.1.2. Personal protection equipment:

- Breathers that abide to EN149 are recommended
- The use of gloves and safely glasses in very dusty areas.

6.1.3. Emergency procedures:

Not required

6.2. Relevant environmental precautions:

- Avoid the product entering sewers or running water.
- Place bins to discard residues according to the law.
- If the product pollutes groundwater, rivers or sewers, inform local authorities in accordance with the regulation procedures.

• Superflor 21% Boron Soluble Powder is a powdered product which is soluble in water and that, in high concentrations, can cause harm to trees and vegetation when absorbed by the roots.

6.3. Containment and cleaning material and methods:

6.3.1. Cleaning:

Hoover or sweep with a broom and spade without lifting dust and use a container which abides by the law to discard it. Avoid polluting surrounding water and spilling when cleaning.

6.3.2. Water spills:

- Take the solution to a neutralization pond. Prevent the solution from being consumed or from polluting water sources or effluents.
- Warn local authorities so that none of the effected water is used for irrigation or as drinking water until natural dilution brings boron back to the normal environmental level.

6.4. References to other sections: See section 8, 12 y 13.

7.1. Precautions for secure handling:

- · Avoid dust formation and handle in ventilated areas.
- For personal safety see section 8.
- Avoid exposure and seek specific instructions before use.
- Handle product away from sewers, surface and underground water and human consumption water sources.
- Eating, drinking and smoking are prohibited in working areas.

7.2. Safe storage conditions and possible incompatibilities:

- It is recommended to store the product in a closed area under dry conditions. In order to maintain the characteristics of the product and the integrity of the packing and to minimize possible caking, apply the FIFO (first-in first-out) rotation system.
- Store the product in a dry place.
- Store in a secure place.
- Apply dust prevention procedures in order to minimize the formation and accumulation of dust.

7.3. Specific final uses:

• The product must be kept away from strong reducing agents. Use the handling recommendations when mixing with other substances.

8.1. Control parameters:

8.1.1. Exposure limit in the environment:

- OSHA Permissible Exposure Limit (PEL): 15 mg/m³ of total dust, 5 mg/m³ breathable fraction by dust interference.
- · ACGIH Threshold Limit Value (TLV): 10 mg/m³ of total dust.

8.1.2. DNEL:

Employees:

- Long term systematic effects (cutis): 326 mg/kg body weight/day
- Long term systematic effects (inhaling): 6.9 mg/m³

Population:

· Acute systematic effects (oral): 0.81 mg/kg body weight/day

- Long term systematic effects (cutis): 163.3 mg/kg body weight/day
- Long term systematic effects (inhaling): 3.5 mg/m³
- Long term systematic effects (oral): 0.81 mg/kg body weight/day

8.1.3. PNEC:

- PNEC _{freshwater} = 2.9 mg B/L
- PNEC seawater = 2.9 mg B/L
- PNEC soil = 5.7 mg B/kg dw
- PNEC wastewater treatment = 10 mg /L

8.2. Exposure controls:

8.2.1. Particulate matter emission control:

- Provide a particulate emission control system (confinement, collecting, filtering, solution, etc.)
- Assure adequate ventilation. Use local ventilation to keep dust concentrations in the air under the permitted exposure limits.

8.2.2. Personal protection:

- · Provide special instructions before use.
- Do not handle substance before having read and understood all the safety instructions.
- · Use local escape ventilation.
- It is recommended to use breathers that abide to EN149.
- The use of personal protection equipment is mandatory. Use gloves (rubber, nitrile or butyl are recommended) and safety glasses in very dusty areas.
- · Provide eyewash in operational areas.
- Apply hand-washing protocols (before break and at the end of the working day) as well as clothing change and washing.

8.2.3. Environmental preservation:

Provide particulate emission monitoring data that gives value to the presence or concentration of particulate matter in relation to the permissible limits.

9.1. Basic physical and chemical property information:

Physical state: PowderMolecular weight pH at: 412.52 g/molColour: White22 ºC (Sol. Saturated): 6.85 - 7.85Odour: OdourlessApparent density(20 ºC): 0.5 - 0.60 t/m³

Water solubility (20 °C) : 220 g/L Melting point : 815 °C

Boiling point : Not applicable Ignition point : Not applicable Inflammability : Non-inflammable Vapour pressure (20 °C) : Not available

Partition coefficient (20 °C) : Not available

10.1. Reactivity:

Undetermined

10.2. Chemical stability:

Stable: Under normal usage, storage and transportation conditions.

10.3. Dangerous reaction possibility:

- The reaction with strong reducing agents such as metal hydrides or alkali metals produces hydrogen gas and may cause a dangerous explosive.
- Polymerization is inexistent.

10.4. Conditions to be avoided:

Avoid exposure to humidity during storage and transport.

10.5. Incompatible matter:

It is incompatible with the presence of certain compounds of a basic character. Avoid contact with potassium, acetic acid, carbonates and hydroxides. Strong reducing agents.

10.6.Dangerous decomposition products: None

11.1. Toxicological effects information:

11.1.1. Acute toxicity:

Ingestion:

Male / female rats FIFRA (40 CFR). Testing material (CE name): Disodium Octaborate LD50: 2.55 g/kg (male/female) (according to the Litchfield y Wilcoxon method)

Male rat. 401 guide (Acute oral toxicity) of OCDE. Testing material (CE name):

Disodium Octaborate

LD50: de > body weight 2600 mg/kg (male) (There were no deaths at this dosage level.)

Male / female rats. Testing material (CAS number): 10043-35-3

LD50: 3450 mg/kg body weight (male) (mg of boric acid / kg)

LD50: 4080 mg/kg body weight (female). (mg of boric acid / kg of body weight)

Male rat. 401 guide (Acute oral toxicity) of OCDE. Testing material (CAS number): 1330-43-4 LD50: > 2500 mg/kg body weight

Skin:

Rabbit (White New Zealand) male / female. FIFRA (40 CFR 158, 162); TSCA (40 CFR 798) equivalent or similar to 402 Guide (acute cutis toxicity) of OCDE. Testing material (EC name): Disodium Octaborate. LD50: > 2000 mg/kg body weight (male / female) (There are no lethal effects in limit doses)

Rabbit (White New Zealand) male / female. FIFRA (40 CFR 163). Testing material (CAS number): 10043-35-3

LD50: > 2000 mg/kg body weight (male / female)

Rabbit (White New Zealand) male / female. This study was undertaken in order to stick to the EPA guidelines of the U.S. – FIFRA and was undertaken by the US Food and Drug Laboratories for BPL. Testing material (CAS number): 12179-04-3 LD50: > 2000 mg/kg body weight (male / female)

Inhaling:

Male / female rats. 403 guide of OCDE (Acute inhalation toxicity) Testing material (EC name): Disodium Octaborate

LC50 (4 h): > 2.01 mg/L of air (male / female)

Male / female rats. 403 guide of OCDE (Acute inhalation toxicity) Testing material

(CAS number): 10043-35-3

LC50 (5 h): > 2.03 mg/L of air (male / female)

Male / female rats. 403 guide of OCDE (Acute inhalation toxicity). USEPA FIFRA 40

CFR Part160. Testing material (CAS number): 10043-35-3

LC50 (4 h): > 2.12 mg/L of air (male / female) (This study was undertaken by petition of the U.S. EPA to confirm that the maximum obtainable dosage was of 2 mg/L. It is considered to be an acceptable study by the U.S. EPA.)

Male / female rats. 403 guide of OCDE (Acute inhalation toxicity) Testing material (CAS number): 12179-04-3

LC50 (4 h): > 2.04 mg/L of air (nominal) (male / female) (It doesn't have a lethal effect in limit doses).

Skin irritation:

Skin sensitivity:

Guinea pig (Albino Hartley). Buehler test. 406 guide of OCDE (skin sensitivity).

EPA OPP 81-6 (skin sensitivity). Testing material (EC name): Disodium Octaborate

Positive reaction number: First reading: 3 out of 20 (test group); 24 hours after exposure; dose: 95% of boric acid

Male / female guinea pig (Hartley). Buehler test. 406 guide of OCDE (skin sensitivity).

Testing material: (CAS number): 10043-35-3

Positive reaction number: First reading: 0 out of 20 (test group); 34 hours after exposure; dose: 0.4 g. 95% w/w/boric acid

Male / female guinea pig (Hartley). Buehler test. 406 guide of OCDE (skin sensitivity).

Testing material: (CAS number): 10043-35-3

Positive reaction number: First reading: 0 out of 20 (test group); 34 hours after exposure; dose: 0.4 g. 95% w/w/boric acid

Positive reaction number:

1st reading: 0 out of 20 (test group);24 hours after exposure; dose: 0.4 g al 95% w/w

2nd reading: 0 out of 20 (test group); 48 hours after exposure.; dose: 0.4 g al 95% w/w

1st reading: 0 out of 10 (negative control); 24 hours after exposure; dose: Not applicable

2nd reading: 0 out of 10 (negative control); 48 hours after exposure; dose: Not applicable

1st reading: 10 out of 20 (positive control); 24 hours after exposure; dose: Not specified.

2nd reading not specified: 7 out of 20 (positive control); 48 hours after exposure;

Dose: Not specified.

2nd reading: 7 out of 20 (positive control); 48 hours after exposure; dose: Not specified.

Eye irritation:

Rabbit (White New Zealand). Testing material (EC name):Disodium Octaborate

Category III of toxicity – clear cornea from implication or irritation in 7 days or less.

Total irritation count: 3 out of a maximum of 110 (medium) (time point: 24 hours) (completely reversible within 72 hours.)

Rabbit (White New Zealand). FIFRA (40 CFR, 162) and TSCA (40 CFR 798). Testing material (EC name): Disodium Octaborate

Category II of toxicity – the corneal envelope or the irritation disappeared within 8 – 21 days.

Maximum average total points: 16.6 out of a maximum of 110 (medium) (time: 24 hours) (completely reversible within 10 days)

Rabbit (White New Zealand). FIFRA (40 CFR 158, 162); TSCA (40 CFR 798). Although it was not undertaken by following the OCODE protocol, the study was done according to an acceptable protocol and the U.S. EPA confirmed it to have had good practices laboratory norms (40CFR160). Equivalent

or similar to the 405 guide of OCDE (irritation/corrosion of eye water) Testing material (CAS number): 10043-35-3 Non-irritating (category III of toxicity - la corneal envelope or irritation disappeared after 7 days or less.)

Total irritation points: 13.6 out of a maximum of 110 (medium) (Average time: 24, 48, 72 hours) (completely reversible) (the average points of 60 minutes was of 0.17)

Rabbit (White New Zealand). EPA OPPTS 870.2400 (Acute eye irritation). Equivalent or similar to the 405 guide of OCDE (acute eye irritation/corrosion)

Cornea points: 0.22 out of a maximum of 4 (medium) (Average time: 24, 48 and 72 hours) (completely reversible within 14 days)

Iris points: 0.22 out of a maximum of 2 (medium) (Average time: 24, 48 and 72 hours) (completely reversible within 14 days)

Conjunctiva points: 2.8 out of a maximum of 3 (medium) (Average time: 24, 48 and 72 hours) (completely reversible within 14 days)

Chemosis points: 1.89 out of a maximum of 4 (medium) (Average time: 24, 48 and 72 hours) (completely reversible within 14 days).

Sensibility: It is not a cutaneous sensitizer.

11.1.2. Reproduction toxicity:

Certain studies on food administration in high doses on animals such as rats, mice and dogs showed effects on fertility and testicles. Studies on rats, mice and rabbits have shown that high doses have effects on the development of the foetus and include foetal weight loss and minor variations in the skeleton. The doses administered were equivalent to many times more than the quantity that a human being would normally be exposed to.

11.1.3. Carcinogenicity / mutagenicity:

It is not carcinogen. / It is not mutagen.

11.1.4. Data on humans:

Epidemological studies on human beings do not show an increase on pulmonary disease on the working population with chronic exposure to Disodium Octaborate Tetrahydrate dust. A recent epidemiological study on normal conditions of occupational exposure to borate dusts does not indicate any effect on fertility.

12.1. Toxicity:

12.1.1. Ecotoxicity on animals:

If great quantities and concentrations are dispersed, this may harm sea and land fauna:

· Algae toxicity

Algas, Pseudokirchneriella subcapitata 96 h EC₁₀ = 24.5 mg B/L †

Invertebrate toxicity

Daphnids, Daphnia magna Straus 48 h LC_{50} = 133 mg B/L [‡] Day 21 NOEC-LOEC = 6-13 mg B/L [‡]

Fish toxicity Sea water:

Dab, Limanda limanda 96 h LC_{50} = 74 mg B/L [†]

Freshwater:

Rainbow trout, Salmo gairdneri (embryos in larval phase)

Day 24 LC₅₀ = 150 mg B/L ‡ Day 32 LC₅₀ = 100 mg B/L ‡ Goldfish, *Carassius auratus* (embryos in larval phase) Day 7 LC₅₀ = 46 mg B/L ‡ Day 3 LC₅₀ = 178 mg B/L ‡ Pimephales promelas, 96 h LC₅₀ = 79.7 mg B/L [‡] Test substance: [†]Tetraborate of sodium

[‡] Boric Acid

12.1.2. Ground ecotoxicity:

Boron accumulates in aquatic and land flora. However, it does not magnify through the food chain. The BASF values deriving from the undergone tests in real soil are generally < 100. The laboratory observation and field data indicate that boron body charges diminish in higher trophic levels. Given that boron incorporates itself in plant cellular membranes, a rich diet in vegetal matter is correspondingly high in boron when compared to diets rich in meat and fish. However, animal and human data indicate that boron is rapidly eliminated through fesses and urine and thus, body concentration do not continuously increase. Therefore, secondary poisoning possibilities are insignificant. According to REACH annex IX column 2, the study the study needn't be undertaken if the substance has a low bio-accumulative potential.

12.1.3. Air ecotoxicity:

Superflor 21% Boron Soluble Powder does not evaporate and the particulate emission pollution will depend on the size and the concentration of the particle, mobility and degradability.

12.2. Persistency and degradability:

Boron appears in a natural way and is omnipresent in the environment.

12.3. Bio-accumulation possibility:

Not bio-accumulative.

12.4. Soil mobility:

The product is soluble in water and may filter through the ground.

12.5. PBT and mPmB value results:

It is not persistent or bio-accumulative.

12.6. Other side effects:

None.

13. Elimination Possibility Considerations:

- Eliminate the content/container according to applicable local, regional, national or international regulations.
- Dumping the product is not recommended.
- In the case of great quantities of Superflor 21% Boron Soluble Powder, reusing it for adequate applications is recommended.

13.1. Waste treatment methods:

The application of adequate methods or hiring the services of companies specializing in this issue is suggested.

14. Information Referring to Transportation

Superflor 21% Boron Soluble Powder does not have a UN number and is not regulated by international laws referring to railway, overland, maritime or air transportation.

15.1. Specific substance or mix safety, health and environmental regulations and legislations:

Assure that all national and local regulations are enforced.

• Clean air act (Montreal protocol):

Superflor 21% Boron Soluble Powder was not manufactured with nor does it contain any class I or class II substances that deplete the ozone layer.

• Inventory list of chemical substances:

INTERNATIONAL INVENTORY									
	TSCA	DSL	EINECS	PICCS	ENCS	AICS	IECSC	KECL	NZIOC
Place	U.S.A.	Canada	Europe	Philippines	Japan	Australia	China	Korea	New
									Zealand
Disodium	12280-	12280-	234-541-	٧	٧	٧	٧	٧	٧
Octaborate	03-4	03-4	0						
Tetrahydrate									

• Label information in accordance with the (EC regulation 1272/2008 (classification, packing and labelling of substances and mixtures).

15.2. Chemical safety evaluation:

The chemical safety evaluation has been undertaken.

16.1. MSDS modifications

Version	Change controls
02	The MSDS format has been changed with accordance to the petition in the (EU) N° 453/2010 regulation. Due to this, the (EC Regulation 1907/2006) Registration, Evaluation, Authorization and Restriction of Chemicals (REACH) of the European
03	parliament and council has been changed. Sections 8.1.2 and 8.1.3 were modified according to DOT CSR update. Section 2: Label elements were modified, according to substance classification. Sections 1.1, 3.1 and 15.1: CAS number was modified according to Disodium Octaborate Tetrahydrate
04	Section 3.1: Impurity Data was modified according to the technical specification of the substance.
05	Section 9.1: Solubility Data was modified.
06	Section 8.1.3 was modified according to the latest update of CSR by REACH legislation.
07	Section 9: Water solubility Data and Apparent density were modified according to the technical specification of the substance.
08	Section 2.1 was withdrawn, General Concentration Limits were updated and in point 16.4 Risk and Safety Phrases (according to Directive 2008/58 / EC amending Directive 67/548 / EEC)

16.2. Abbreviations:

• REACH: Registration, Evaluation, Authorization and Restriction of Chemicals

- DNEL: Derived No Effect Level
- PNEC: Predicted No Effect Concentration
- LC₅₀: Lethal Concentration 50

16.3. References:

- o Litovitz T L, Norman S A, Veltri J C, Annual Report of the American Association of Poison Control Centers Data Collection System. Am. J. Emerg. Med. (1986), 4, 427-458
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- o Bev-Lorraine True, PhD, MD y Robert H. Dreisbach, PhD, MD. Manual de Toxicología clínica de Dreisbach.
- o Institute of good safety and toxicology, Danish veterinary and good administration for the Danish EPA. 1999.
- o National Pesticide Information Center, US 2001.
- o (EC Regulation 1907/2006 (Registration, Evaluation, Authorization and Restriction of Chemicals).
- o (EC Regulation 1272/2008 (Classification, Labelling, and Packing of Substances and Mixtures).

16.4. Recommendations for employees:

- The product must not be used for any purpose other than the ones specified in rubric 1 without having previously obtained handling instructions.
- It is at all times the users own responsibility to take all the necessary measures in order to abide to the legal requirements and local regulations.
- The information on this safety data sheet needs to be considered as a description of the safety requirements relevant to our product and not as a guarantee of its properties.