Safety Data Sheet

TRACE ELEMENT DEFENSE

SDS (formerly MSDS)

According to Regulation (EC) No. 453/2010

Date: 12/05/2021

Dutch Direct®

Section 1. Identification

1.1. Product identifier	
Product name:	Trace Element Defense
1.2. Relevant identified uses of the substance or mixture and uses advised against	
1.2.1. Relevant identified uses	
Recommended use:	Plant Micronutrient.
Recommended restrictions:	None known.
1.2.2. Manufacturer/Importer/Supplier/Distributor information Manufacturer	
Manufacturer/Supplier	18 North 57th Drive Ste #1 Phoenix Az 85043 United States Tel: +1 (844) 388-2434 info@dutchdirect.us
1.3. Emergency	
For Chemical Emergency Call CHEMTREC day or night.	
USA/Canada	1.800.424.9300
Mexico	1.800.681.9531
Outside USA/Canada (collect calls accepted)	1.703.527.3887 (collect calls accepted)

Section 2. Hazard(s) identification

Physical hazards	Not classified.	
Health hazards	Serious eye damage/eye irritation	Category 1
	Reproductive toxicity	Category 1B
OSHA defined hazards	Combustible dust	
Label elements		

Signal word:	Danger
Hazard statement:	May form combustible dust concentrations in air. Causes serious eye damage. May damage fertility or the unborn child.
Precautionary statement Prevention:	Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Prevent dust accumulation to minimize explosion hazard. Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Keep container tightly closed. Ground/bond container and receiving equipment. Avoid release to the environment. Wear protective gloves/protective clothing/eye protection/face protection. Observe good industrial hygiene practices.
Response:	If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a poison center/doctor. Take off contaminated clothing and wash it before reuse. In case of fire: Use appropriate media to extinguish. Collect spillage.
Storage:	Store locked up.
Disposal:	Dispose of contents/container in accordance with local/regional/national/international regulations.
Hazard(s) not otherwise classified (HNOC):	None known.
Supplemental information	None.

Section 3. Composition/information on ingredients

3.1. Mixture

Chemical name	CAS number	%
Zinc oxide	1314-13-2	15 - 40
Boron sodium oxide, tetrahydrate	12280-03-4	5 - 10
Zinc Sulfate Monohydrate	7446-19-7	2 - 8
Boron Potassium Oxide Tetrahydrate	12045-78-2	1 - 5
Iron oxide	1309-37-1	< 4
Copper Sulfate Pentahydrate	7758-99-8	0.1 - 1
Iron Glycinate	20150-34-9	< 1

Composition comments	Hydrated forms of chemical substances are exempt from the TSCA Inventory as mixtures. See the anhydrous form of the chemical substances for the TSCA Inventory.

Section 4. First aid measures

4.1. Description of first aid measures

Inhalation:	Move to fresh air. Call a physician if symptoms develop or persist.
Skin contact:	Wash off with soap and water. Get medical attention if irritation develops and persists.
Eye contact:	Do not rub eyes. Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention immediately.
Ingestion:	Rinse mouth. Get medical attention if symptoms occur.
Most important symptoms/ effects, acute and delayed:	Headache. Nausea, vomiting. Severe eye irritation. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Permanent eye damage including blindness could result. Dusts may irritate the respiratory tract, skin and eyes. Coughing.
Indication of immediate medical attention and special treatment needed:	Provide general supportive measures and treat symptomatically. Keep victim under observation. Symptoms may be delayed.
General information:	IF exposed or concerned: Get medical advice/attention. If you feel unwell, seek medical advice (show the label where possible). Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Show this safety data sheet to the doctor in attendance.

Section 5. Fire-fighting measures

5.1. Extinguishing media

Suitable extinguishing media:	Avoid high pressure media which could cause the formation of a potentially explosible dust-air mixture. Apply extinguishing media carefully to avoid creating airborne dust.
Unsuitable extinguishing media:	Do not use water jet as an extinguisher, as this will spread the fire.
Specific hazards arising from the chemical:	Explosion hazard: Avoid generating dust; fine dust dispersed in air in sufficient concentrations and in the presence of an ignition source is a potential dust explosion hazard.
Special protective equipment and precautions for firefighters:	Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

Fire fighting equipment/instructions:	In case of fire and/or explosion do not breathe fumes.
Specific methods:	Use standard firefighting procedures and consider the hazards of other involved materials.
General fire hazards:	May form combustible dust concentrations in air.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures:	Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Use only non-sparking tools. Dust deposits should not be allowed to accumulate on surfaces, as these may form an explosive mixture if they are released into the atmosphere in sufficient concentration. Wear appropriate protective equipment and clothing during clean-up. Use a NIOSH/MSHA approved respirator if there is a risk of exposure to dust/fume at levels exceeding the exposure limits. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ensure adequate ventilation. Local authorities should be advised if significant spillagescannot be contained. For personal protection, see section 8 of the SDS.
Methods and materials for containment and cleaning up:	Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Take precautionary measures against static discharge. Use only non-sparking tools. Avoid dispersal of dust in the air (i.e., clearing dust surfaces with compressed air). Collect dust using a vacuum cleaner equipped with HEPA filter. Prevent product from entering drains. Stop the flow of material, if this is without risk. **Large Spills:** Wet down with water and dike for later disposal. Shovel the material into waste container. Following product recovery, flush area with water. **Small Spills:** Sweep up or vacuum up spillage and collect in suitable container for disposal. Clean surface thoroughly to remove residual contamination. Never return spills to original containers for re-use. For waste disposal, see section 13 of the SDS.
Environmental precautions:	Avoid release to the environment. Inform appropriate managerial or supervisory personnel of all environmental releases. Prevent further leakage or spillage if safe to do so. Avoid discharge into drains, water courses or onto the ground.

Section 7. Handling and storage

Precautions for safe handling:	Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Minimize dust generation and accumulation. Avoid significant deposits of material, especially on horizontal surfaces, which may become airborne and form combustible dust clouds and may contribute to secondary explosions. Routine housekeeping should be instituted to ensure that dusts do not accumulate on surfaces. Dry powders can build static electricity charges when subjected to the friction of transfer and mixing operations. Provide adequate precautions, such as electrical grounding and bonding, or inert atmospheres. Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Combustible dust clouds may be created where operations produce fine material (dust). Handling and processing operations should be conducted in accordance with 'best practices' (e.g. NFPA-654). Explosion-proof general and local exhaust ventilation. Do not get this material in contact with eyes. Avoid prolonged exposure. Pregnant or breastfeeding women must not handle this product. Should be handled in closed systems, if possible. Wear appropriate personal protective equipment. Avoid release to the environment. Observe good industrial hygiene practices.
Conditions for safe storage, including any incompatibilities:	Store locked up. Keep containers tightly closed in a dry, cool and well-ventilated place. Store away from incompatible materials (see Section 10 of the SDS).

Section 8. Exposure controls/personal protection

Occupational exposure limits			
U.S. - OSHA Components	**Type**	**Value**	**Form**
Boron sodium oxide, tetrahydrate (CAS 12280-03-4)	PEL	5 mg/m3	Respirable dust.
		15 mg/m3	Total Dust.
US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)			
U.S. - OSHA Components	**Type**	**Value**	**Form**
Iron oxide (CAS 1309-37-1)	PEL	10 mg/m3	Fume.
US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)			
Components	**Type**	**Value**	**Form**
Zinc oxide (CAS 1314-13-2)	PEL	5 mg/m3	Fume.
		5 mg/m3	Respirable fraction.
		15 mg/m3	Total dust.

US. OSHA Table Z-3 (29 CFR 1910.1000)

Components	Type	Value	Form
Zinc oxide (CAS 1314-13-2)	TWA	0.8 mg/m3	Fume.
		20 mppcf	
Iron oxide (CAS 1309-37-1)	TWA	5 mg/m3	Respirable fraction.
		15 mg/m3	Total dust.
		50 mppcf	Total dust.
		15 mppcf	Respirable fraction.

ACGIH

Components	Type	Value	Form
Copper Sulfate Pentahydrate (CAS 7758-99-8)	TWA	1 mg/m3	Dust and mist. (as Cu)
		0.1 mg/m3	Fume. (as Cu)

US. ACGIH Threshold Limit Values

Components	Type	Value	Form
Boron sodium oxide, tetrahydrate (CAS 12280-03-4)	STEL	6 mg/m3	Inhalable fraction.
	TWA	2 mg/m3	Inhalable fraction.
Copper Sulfate Pentahydrate (CAS 7758-99-8)	TWA	1 mg/m3	Dust and mist.
		2 mg/m3	Fume.
Iron oxide (CAS 1309-37-1)	TWA	5 mg/m3	Respirable fraction.
Zinc oxide (CAS 1314-13-2)	STEL	10 mg/m3	Respirable fraction.
	TWA	2 mg/m3	Respirable fraction.

US. NIOSH: Pocket Guide to Chemical Hazards

Components	Type	Value	Form
Copper Sulfate Pentahydrate (CAS 7758-99-8)	TWA	1 mg/m3	Dust and mist.
		0.1 mg/m3	Fume.

Iron oxide (CAS 1309-37-1)	TWA	5 mg/m3	Dust and fume.
Zinc oxide (CAS 1314-13-2)	Ceiling	15 mg/m3	Dust.
	STEL	10 mg/m3	Fume.
	TWA	5 mg/m3	Fume.
		5 mg/m3	Dust.

Biological limit values	No biological exposure limits noted for the ingredient(s).
Appropriate engineering controls	Explosion-proof general and local exhaust ventilation. Good general ventilation should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. It is recommended that all dust control equipment such as local exhaust ventilation and material transport systems involved in handling of this product contain explosion relief vents or an explosion suppression system or an oxygen-deficient environment. Ensure that dust-handling systems (such as exhaust ducts, dust collectors, vessels, and processing equipment) are designed in a manner to prevent the escape of dust into the work area (i.e., there is no leakage from the equipment). If engineering measures are not sufficient to maintain concentrations of dust particulates below the Occupational Exposure Limit (OEL), suitable respiratory protection must be worn. Use only appropriately classified electrical equipment and powered industrial trucks. Provide eyewash station.
Individual protection measures, such as personal protective equipment	
Eye/face protection	Wear safety glasses with side shields (or goggles).
Skin protection Hand protection	Wear appropriate chemical resistant gloves.
Skin protection Other	Wear suitable protective clothing. Use of an impervious apron is recommended.
Respiratory protection	Use a NIOSH/MSHA approved respirator if there is a risk of exposure to dust/fume at levels exceeding the exposure limits. Chemical respirator with organic vapor cartridge, full facepiece, dust and mist filter.
Thermal hazards	Wear appropriate thermal protective clothing, when necessary.
General hygiene considerations	Observe any medical surveillance requirements. When using, do not eat, drink or smoke. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

Section 9. Physical and chemical properties

Appearance	
Physical state:	Solid
Form	Powder.
Color:	Pink
Odour:	Not available.
Odour threshold:	Not available.
pH:	6.5 - 7
Melting point/freezing point:	Not available.
Initial boiling point and boiling range:	Not available.
Flash point:	Not available.
Evaporation rate:	Not available.
Flammability (solid, gas):	Not available.
Upper/lower flammability or explosive limits	
Explosive limit - lower (%):	Not available.
Explosive limit - upper (%):	Not available.
Vapor pressure:	Not available.
Vapor density:	Not available.
Relative density:	Not available.
Solubility(ies)	
Solubility (water):	Not available.
Partition coefficient (n-octanol/water):	Not available.
Auto-ignition temperature:	Not available.
Decomposition temperature:	Not available.
Viscosity:	Not available.
Other information	
Explosive properties:	Not explosive.
Oxidizing properties:	Not oxidizing.

Section 10. Stability and reactivity

10.1. Reactivity
The product is stable and non-reactive under normal conditions of use, storage and transport.
10.2. Chemical stability
Material is stable under normal conditions.
10.3. Possibility of hazardous reactions
No dangerous reaction known under conditions of normal use.
10.4. Conditions to avoid
Keep away from heat, sparks and open flame. Contact with incompatible materials. Minimize dust generation and accumulation.
10.5. Incompatible materials
Chlorine. Fluorine.
10.6. Hazardous decomposition products
Metal oxides.

Section 11. Toxicological information

Information on likely routes of exposure	
Inhalation	Dust may irritate respiratory system. Prolonged inhalation may be harmful.
Skin contact	Dust or powder may irritate the skin.
Eye contact	Causes serious eye damage.
Ingestion	May cause discomfort if swallowed.
Symptoms related to the physical, chemical and toxicological characteristics:	Headache. Nausea, vomiting. Severe eye irritation. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Permanent eye damage including blindness could result. Dusts may irritate the respiratory tract, skin and eyes. Coughing.

Information on toxicological effects **Acute toxicity**		
Components	**Species**	**Test Results**
Copper Sulfate Pentahydrate (CAS 7758-99-8)		
Acute Dermal LD50	Sprague-Dawley rat	> 2000 mg/kg, 24 hours
Oral LD50	Sprague-Dawley rat	841 mg/kg
Skin corrosion/irritation		
Prolonged skin contact may cause temporary irritation.		
Serious eye damage/eye irritation:	Causes serious eye damage.	
Respiratory or skin sensitization		
Respiratory sensitization	Not a respiratory sensitizer.	
Skin sensitization	This product is not expected to cause skin sensitization.	
Germ cell mutagenicity		
No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.		
Carcinogenicity		
Not classifiable as to carcinogenicity to humans.		
IARC Monographs. Overall Evaluation of Carcinogenicity		
Iron oxide (CAS 1309-37-1)	3 Not classifiable as to carcinogenicity to humans.	
NTP Report on Carcinogens		
Not listed.		
OSHA Specifically Regulated Substances (29 CFR 1910.1001-1053)		
Not listed.		
Reproductive toxicity:	May damage fertility or the unborn child.	
Specific target organ toxicity - single exposure:	Not classified.	
Specific target organ toxicity - single exposure:	Not classified.	
Aspiration hazard:	Not an aspiration hazard.	
Chronic effects:	Prolonged inhalation may be harmful.	

Section 12. Ecological information

Ecotoxicity			
Very toxic to aquatic life with long lasting effects.			
Components		**Species**	**Test Results**
Copper Sulfate Pentahydrate (CAS 7758-99-8)			
Aquatic *Acute*			
Fish	LC50	Cyprinus carpio	2100 µg/l, 24 hours 1000 µg/l, 48 hours 810 µg/l, 96 hours
Zinc oxide (CAS 1314-13-2)			
Aquatic			
Crustacea	**LC50**	Water flea (Daphnia magna)	0.098 mg/l, 48 Hours
Zinc Sulfate Monohydrate (CAS 7446-19-7)			
Aquatic			
Crustacea	EC50	Water flea (Ceriodaphnia dubia)	0.06 mg/l, 48 hours
Fish	LC50	Hirame, flounder (Paralichthys olivaceus)	< 10 mg/l, 96 hours
Persistence and degradability			
No data is available on the degradability of any ingredients in the mixture.			
Bioaccumulative potential		No data available.	
Mobility in soil		No data available.	
Other adverse effects		No data available.	

Section 13. Disposal considerations

13. Waste treatment methods	
Disposal instructions:	Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Incinerate the material under controlled conditions in an approved incinerator. Do not allow this material to drain into sewers/water supplies. Do not contaminate ponds, waterways or ditches with chemical or used container. Dispose of contents/ container in accordance with local/regional/national/international regulations.

Local disposal regulations:	Dispose in accordance with all applicable regulations.
Hazardous waste code:	The waste code should be assigned in discussion between the user, the producer and the waste disposal company.
Waste from residues / unused products:	Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).
Contaminated packaging:	Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal.

Section 14. Transport information

DOT	
UN number	
UN3077	
UN proper shipping name	
Environmentally hazardous substances, solid, n.o.s. (Zinc oxide)	
Transport hazard class(es)	
Class	9
Subsidiary risk	-
Label(s)	9
Packing group	III
Environmental hazards	
Marine pollutant:	Yes
Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.
	DOT (Road/Rail): Non-bulk shipments of this material are non-regulated for domestic ground transportation when they meet the requirements of 49 CFR 171.4(c).
Special provisions	8, 146, 335, A112, B54, IB8, IP3, N20, T1, TP33

Packaging exceptions	155
Packaging non bulk	213
Packaging bulk	240
IATA	
UN number	UN3077
UN proper shipping name	Environmentally hazardous substance, solid, n.o.s. (Zinc oxide)
Transport hazard class(es)	
Class	9
Subsidiary risk	-
Packing group	III
Environmental hazards	Yes.
ERG Code	9L
Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.
IMDG	
UN number	UN3077
UN proper shipping name	Environmentally hazardous substance, solid, n.o.s. (Zinc oxide)
Transport hazard class(es)	
Class	9
Subsidiary risk	-
Packing group	III
Environmental hazards	
Marine pollutant:	Yes

EmS	F-A, S-F
Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.
Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	Not applicable.

Section 15. Regulatory information

US Federal Regulations	
This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.	
TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)	
Not regulated.	
CERCLA Hazardous Substance List (40 CFR 302.4)	
Zinc oxide (CAS 1314-13-2)	Listed.
SARA 304 Emergency release notification	
Not regulated.	
OSHA Specifically Regulated Substances (29 CFR 1910.1001-1053)	
Not listed.	
Toxic Substances Control Act (TSCA)	
All components of the mixture on the TSCA 8(b) inventory are designated “active”. All components on the TSCA 8(b) inventory are designated “active”.	
Superfund Amendments and Reauthorization Act of 1986 (SARA)	
SARA 302 Extremely hazardous substance	
Not listed.	
SARA 311/312 Hazardous chemical	Yes
Classified hazard categories	Combustible dust Serious eye damage or eye irritation Reproductive toxicity

SARA 313 (TRI reporting)		
Chemical name	**CAS number**	**% by wt.**
Copper Sulfate Pentahydrate	7758-99-8	0.1 - 1
Zinc Oxide	1314-13-2	15 - 40
Zinc Sulfate Monohydrate	7446-19-7	2 - 8
Other federal regulations		
Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List		
-		
Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)		
Not regulated.		
Safe Drinking Water Act (SDWA)	Contains component(s) regulated under the Safe Drinking Water Act.	

US state regulations
US. Massachusetts RTK - Substance List
Copper Sulfate Pentahydrate (CAS 7758-99-8)
Iron oxide (CAS 1309-37-1)
Zinc oxide (CAS 1314-13-2)
Zinc Sulfate Monohydrate (CAS 7446-19-7)
US. New Jersey Worker and Community Right-to-Know Act
Boron Potassium Oxide Tetrahydrate (CAS 12045-78-2)
Boron sodium oxide, tetrahydrate (CAS 12280-03-4)
Iron oxide (CAS 1309-37-1)
Zinc oxide (CAS 1314-13-2)
Zinc Sulfate Monohydrate (CAS 7446-19-7)
US. Pennsylvania Worker and Community Right-to-Know Law
Copper Sulfate Pentahydrate (CAS 7758-99-8)
Iron oxide (CAS 1309-37-1)
Zinc oxide (CAS 1314-13-2)
Zinc Sulfate Monohydrate (CAS 7446-19-7)

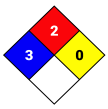
US. Rhode Island RTK
Iron oxide (CAS 1309-37-1)
Zinc oxide (CAS 1314-13-2)

California Proposition 65		
	**WARNING:**	This product can expose you to Naphthalene, which is known to the State of California to cause cancer. For more information go to **www.P65Warnings.ca.gov.**
California Proposition 65 - CRT: Listed date/Carcinogenic substance		
Naphthalene (CAS 91-20-3)	Listed: April 19, 2002	
US. California. Candidate Chemicals List. Safer Consumer Products Regulations (Cal. Code Regs, tit. 22, 69502.3, subd. (a))		
Boric acid (CAS 10043-35-3)		
Boron sodium oxide, tetrahydrate (CAS 12280-03-4)		

International Inventories		
Country(s) or region	**Inventory name**	**On inventory (yes/no)***
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	yes
*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s) A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).		

Section 16. Other information, including date of preparation or last revision

Issue date	01-June-2021
Revision date	02-July-2021
Version #	02
Further information	Refer to: OSHA 3371-08 2009, Hazard Communication Guidance for Combustible Dusts NFPA 654, Standard for the Prevention of Fire and Dust Explosions from the Manufacturing, Processing, and Handling of Combustible Particulate Solids
HMIS® ratings	Health: 3* Flammability: 0 Physical hazard: 0

NFPA ratings	
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FORMULA 1
FERTILIZERS

Dutch Direct®

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