

1. Identification

Product identifier Brandt Ligno Hort Mix
Other means of identification
Product code 24026
Recommended use Agricultural/ Horticultural Use- Micronutrient Fertilizer- Refer to product label.
Recommended restrictions Refer to product label.

Manufacturer/Importer/Supplier/Distributor information**Manufacturer**

Company name Brandt Consolidated, Inc.
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Springfield, IL 62711
United States
Telephone Corporate Office 1-217-547-5800
Website www.brandt.co
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Contact person EH&S / Regulatory Department
Emergency phone number CHEMTREC (24 hours):
USA, Canada, Puerto Rico 1-800-424-9300
Virgin Islands 1-800-424-9300
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2. Hazard(s) identification

Physical hazards Not classified.
Health hazards Acute toxicity, inhalation Category 1
Skin corrosion/irritation Category 2
Serious eye damage/eye irritation Category 2A
Carcinogenicity Category 1B
Reproductive toxicity Category 2
Specific target organ toxicity, repeated exposure Category 2
Environmental hazards Hazardous to the aquatic environment, acute hazard Category 3
OSHA defined hazards Not classified.
Label elements



Signal word Danger
Hazard statement Causes serious eye irritation. May cause cancer. Suspected of damaging fertility or the unborn child. May cause damage to organs through prolonged or repeated exposure. Harmful to aquatic life. Harmful to aquatic life with long lasting effects.
Precautionary statement
Prevention Do not breathe mist or vapor. Wash thoroughly after handling. Avoid release to the environment. Wear protective gloves/protective clothing/eye protection/face protection.
Response If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If exposed or concerned: Get medical advice/attention. If eye irritation persists: Get medical advice/attention.
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.

3. Composition/information on ingredients

Mixtures

Chemical name	Common name and synonyms	CAS number	%
FERROUS SULFATE		7782-63-0	5 - < 10
Disodium Octaborate Tetrahydrate		12008-41-2	1 - < 3*
Manganese Sulfate, monohydrate		10034-96-5	1 - < 3*
Zinc Sulfate		7733-02-0	1 - < 3
Cobalt Sulfate, Monohydrate		10124-43-3	< 0.1*
Other components below reportable levels			80 - < 90

*Designates that a specific chemical identity and/or percentage of composition has been withheld as a trade secret.

4. 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 Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.

Ingestion Rinse mouth. Get medical attention if symptoms occur.

Most important symptoms/effects, acute and delayed Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Severe eye irritation. Prolonged exposure may cause chronic effects.

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. 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.

5. Fire-fighting measures

Suitable extinguishing media Water fog. Foam. Dry chemical powder. Carbon dioxide (CO₂).

Unsuitable extinguishing media Do not use water jet as an extinguisher, as this will spread the fire.

Specific hazards arising from the chemical During fire, gases hazardous to health may be formed.

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 Move containers from fire area if you can do so without risk.

Specific methods Use standard firefighting procedures and consider the hazards of other involved materials.

General fire hazards No unusual fire or explosion hazards noted.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Keep out of low areas. Wear appropriate protective equipment and clothing during clean-up. Do not breathe mist or vapor. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ensure adequate ventilation. Local authorities should be advised if significant spillages cannot be contained. For personal protection, see section 8 of the SDS.

Methods and materials for containment and cleaning up

Large Spills: Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Cover with plastic sheet to prevent spreading. Absorb in vermiculite, dry sand or earth and place into containers. Following product recovery, flush area with water.

Small Spills: Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination.

Never return spills to original containers for re-use. Prevent entry into waterways, sewer, basements or confined areas. 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. Contact local authorities in case of spillage to drain/aquatic environment. Prevent further leakage or spillage if safe to do so. Avoid discharge into drains, water courses or onto the ground.

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. Do not breathe mist or vapor. Avoid contact with eyes. Avoid prolonged exposure. Provide adequate ventilation. Should be handled in closed systems, if possible. Wear appropriate personal protective equipment. Pregnant or breastfeeding women must not handle this product. Avoid release to the environment. Observe good industrial hygiene practices.

Conditions for safe storage, including any incompatibilities

Store locked up. Store in original tightly closed container. Keep container tightly closed. Store away from incompatible materials (see Section 10 of the SDS).

8. Exposure controls/personal protection**Occupational exposure limits****US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)**

Components	Type	Value
Manganese Sulfate, monohydrate (CAS 10034-96-5)	Ceiling	5 mg/m ³

US. ACGIH Threshold Limit Values

Components	Type	Value	Form
Cobalt Sulfate, Monohydrate (CAS 10124-43-3)	TWA	0.02 mg/m ³	
Disodium Octaborate Tetrahydrate (CAS 12008-41-2)	STEL	6 mg/m ³	Inhalable fraction.
Manganese Sulfate, monohydrate (CAS 10034-96-5)	TWA	2 mg/m ³	Inhalable fraction.
	TWA	0.1 mg/m ³	Inhalable fraction.
		0.02 mg/m ³	Respirable fraction.

US. NIOSH: Pocket Guide to Chemical Hazards

Components	Type	Value	Form
Manganese Sulfate, monohydrate (CAS 10034-96-5)	STEL	3 mg/m ³	Fume.
	TWA	1 mg/m ³	Fume.

Biological limit values**ACGIH Biological Exposure Indices**

Components	Value	Determinant	Specimen	Sampling Time
Cobalt Sulfate, Monohydrate (CAS 10124-43-3)	15 µg/l	Cobalt	Urine	*

* - For sampling details, please see the source document.

Appropriate engineering controls

Good general ventilation (typically 10 air changes per hour) 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. Provide eyewash station.

Individual protection measures, such as personal protective equipment

Eye/face protection	Chemical respirator with organic vapor cartridge and full facepiece.
Skin protection	
Hand protection	Wear appropriate chemical resistant gloves.
Other	Wear suitable protective clothing. Use of an impervious apron is recommended.
Respiratory protection	Chemical respirator with organic vapor cartridge and full facepiece.
Thermal hazards	Wear appropriate thermal protective clothing, when necessary.
General hygiene considerations	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.

9. Physical and chemical properties

Appearance	Viscous. Liquid.
Physical state	Liquid.
Form	Liquid.
Color	Dark brown.
Odor	slight lignin
Odor threshold	Not available.
pH	5.9 (typical)
Melting point/freezing point	1832 °F (1000 °C) estimated
Initial boiling point and boiling range	Not available.
Flash point	Not available.
Evaporation rate	Not available.
Flammability (solid, gas)	Noncombustible
Upper/lower flammability or explosive limits	
Flammability limit - lower (%)	Not available.
Flammability limit - upper (%)	Not available.
Explosive limit - lower (%)	Not available.
Explosive limit - upper (%)	Not available.
Vapor pressure	0.00001 hPa estimated
Vapor density	< 1
Relative density	1.15 g/cm ³ (typical)
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	
Density	2.67 g/cm ³ estimated
Percent volatile	76.1 % estimated
pH in aqueous solution	5 - 7
Pounds per gallon	9.6 lb/gal (typical)
Specific gravity	2.67 estimated

10. Stability and reactivity

Reactivity	The product is stable and non-reactive under normal conditions of use, storage and transport.
Chemical stability	Material is stable under normal conditions.

Possibility of hazardous reactions	Hazardous polymerization does not occur.
Conditions to avoid	Contact with incompatible materials.
Incompatible materials	Strong oxidizing agents.
Hazardous decomposition products	No hazardous decomposition products are known.

11. Toxicological information

Information on likely routes of exposure

Inhalation	Prolonged inhalation may be harmful. May cause damage to organs through prolonged or repeated exposure by inhalation.
Skin contact	No adverse effects due to skin contact are expected.
Eye contact	Causes serious eye irritation.
Ingestion	Expected to be a low ingestion hazard.
Symptoms related to the physical, chemical and toxicological characteristics	Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Severe eye irritation.

Information on toxicological effects

Acute toxicity

Product	Species	Test Results
Brandt Ligno Hort Mix		
Acute		
Inhalation		
LD50	Rat	19300 mg/l, 4 hours estimated
Oral		
LD100	Mouse	21034 mg/kg estimated
LD50	Mouse	16527 mg/kg estimated
	Rat	85755 mg/kg estimated
Components	Species	Test Results
Cobalt Sulfate, Monohydrate (CAS 10124-43-3)		
Acute		
Oral		
LD50	Mouse	584 mg/kg
	Rabbit	1800 mg/kg
	Rat	424 mg/kg
Disodium Octaborate Tetrahydrate (CAS 12008-41-2)		
Acute		
Dermal		
LD50	Rabbit	> 2000 mg/kg
Oral		
LD50	Guinea pig	5300 mg/kg
	Rat	2550 mg/kg
		2 g/kg
Manganese Sulfate, monohydrate (CAS 10034-96-5)		
Acute		
Oral		
LD100	Mouse	305 mg/kg
Zinc Sulfate (CAS 7733-02-0)		
Acute		
Dermal		
LD50	Rat	> 2000 mg/kg

Components	Species	Test Results
Oral LD50	Rat	623 mg/kg

* Estimates for product may be based on additional component data not shown.

Skin corrosion/irritation	Prolonged skin contact may cause temporary irritation.	
Serious eye damage/eye irritation	Causes serious eye irritation.	
Respiratory or skin sensitization		
Respiratory sensitization	Not available.	
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	May cause cancer.	
IARC Monographs. Overall Evaluation of Carcinogenicity	Not listed.	
OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)	Not regulated.	
US. National Toxicology Program (NTP) Report on Carcinogens	Cobalt Sulfate, Monohydrate (CAS 10124-43-3) Reasonably Anticipated to be a Human Carcinogen.	
Reproductive toxicity	Suspected of damaging fertility or the unborn child.	
Specific target organ toxicity - single exposure	Not classified.	
Specific target organ toxicity - repeated exposure	May cause damage to organs through prolonged or repeated exposure.	
Aspiration hazard	Not available.	
Chronic effects	Prolonged inhalation may be harmful. May cause damage to organs through prolonged or repeated exposure.	

12. Ecological information

Ecotoxicity Harmful to aquatic life with long lasting effects.

Product	Species	Test Results
Brandt Ligno Hort Mix		
Aquatic		
Crustacea	EC50	Daphnia 1553.6523 mg/l, 48 hours estimated
Fish	LC50	Fish 10853.2246 mg/l, 96 hours estimated
Components	Species	Test Results
Cobalt Sulfate, Monohydrate (CAS 10124-43-3)		
Aquatic		
Fish	LC50	Fathead minnow (Pimephales promelas) 3.75 mg/l, 96 hours
Disodium Octaborate Tetrahydrate (CAS 12008-41-2)		
Aquatic		
<i>Acute</i>		
Crustacea	LC50	Daphnia magna 619 mg/l
Fish	LC50	Pimephales promelas 370 mg/l
Manganese Sulfate, monohydrate (CAS 10034-96-5)		
Aquatic		
Crustacea	EC50	Water flea (Daphnia obtusa) 30.8 - 44.1 mg/l, 48 hours
Fish	LC50	Fathead minnow (Pimephales promelas) 36.9 mg/l, 96 hours 29.7 - 52.7 mg/l, 192 hours

Components	Species	Test Results
Zinc Sulfate (CAS 7733-02-0)		
Aquatic		
Algae	LC50	Green algae (<i>Chlorella vulgaris</i>) 5 mg/l, 24 hours
Crustacea	EC50	Amphipod (<i>Crangonyx pseudogracilis</i>) 15.1 - 24.5 mg/l, 96 hours
		Rotifer (<i>Philodina acuticornis</i>) 0.5 mg/l, 48 hours
Fish	LC50	Fathead minnow (<i>Pimephales promelas</i>) 10.62 - 11.3 mg/l, 5 days
		Fish (<i>Lepidocephalichthyes guntea</i>) 0.168 - 0.25 mg/l, 96 hours 76 - 118.8 mg/l, 24 hours

* Estimates for product may be based on additional component data not shown.

Persistence and degradability	No data is available on the degradability of this product.
Bioaccumulative potential	Not available.
Mobility in soil	No data available.
Other adverse effects	No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

13. Disposal considerations

Disposal instructions	Collect and reclaim or dispose in sealed containers at licensed waste disposal site. 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	Empty containers should be taken to an approved waste handling site for recycling or disposal. Since emptied containers may retain product residue, follow label warnings even after container is emptied.

14. Transport information

DOT	Not regulated as dangerous goods.
IATA	Not regulated as dangerous goods.
IMDG	Not regulated as dangerous goods.

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)	
Cobalt Sulfate, Monohydrate (CAS 10124-43-3)	Listed.
FERROUS SULFATE (CAS 7782-63-0)	Listed.
Manganese Sulfate, monohydrate (CAS 10034-96-5)	Listed.
Zinc Sulfate (CAS 7733-02-0)	Listed.
SARA 304 Emergency release notification	
Not regulated.	
OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)	
Not regulated.	

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories Immediate Hazard - Yes
 Delayed Hazard - Yes
 Fire Hazard - No
 Pressure Hazard - No
 Reactivity Hazard - No

SARA 302 Extremely hazardous substance

Not listed.

SARA 311/312 Hazardous chemical No

SARA 313 (TRI reporting)

Chemical name	CAS number	% by wt.
Manganese Sulfate, monohydrate	10034-96-5	1 - < 3
Zinc Sulfate	7733-02-0	1 - < 3

Other federal regulations**Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List**

Cobalt Sulfate, Monohydrate (CAS 10124-43-3)
 Manganese Sulfate, monohydrate (CAS 10034-96-5)

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Not regulated.

Safe Drinking Water Act (SDWA) Not regulated.

US state regulations**US. California Controlled Substances. CA Department of Justice (California Health and Safety Code Section 11100)**

Not listed.

US. California. Candidate Chemicals List. Safer Consumer Products Regulations (Cal. Code Regs, tit. 22, 69502.3, subd. (a))

Cobalt Sulfate, Monohydrate (CAS 10124-43-3)

US. Massachusetts RTK - Substance List

FERROUS SULFATE (CAS 7782-63-0)
 Zinc Sulfate (CAS 7733-02-0)

US. New Jersey Worker and Community Right-to-Know Act

Cobalt Sulfate, Monohydrate (CAS 10124-43-3)
 Disodium Octaborate Tetrahydrate (CAS 12008-41-2)
 Manganese Sulfate, monohydrate (CAS 10034-96-5)
 Zinc Sulfate (CAS 7733-02-0)

US. Pennsylvania Worker and Community Right-to-Know Law

FERROUS SULFATE (CAS 7782-63-0)
 Zinc Sulfate (CAS 7733-02-0)

US. Rhode Island RTK

Cobalt Sulfate, Monohydrate (CAS 10124-43-3)
 FERROUS SULFATE (CAS 7782-63-0)
 Manganese Sulfate, monohydrate (CAS 10034-96-5)
 Zinc Sulfate (CAS 7733-02-0)

US. California Proposition 65

WARNING: This product contains a chemical known to the State of California to cause cancer and birth defects or other reproductive harm.

US - California Proposition 65 - CRT: Listed date/Carcinogenic substance

Cobalt Sulfate, Monohydrate (CAS 10124-43-3) Listed: May 20, 2005

International Inventories

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	No
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	No

Country(s) or region	Inventory name	On inventory (yes/no)*
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	No
Korea	Existing Chemicals List (ECL)	No
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	No

*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).

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

Issue date	05-18-2015
Revision date	06-12-2017
Version #	07

Disclaimer

The information provided in this Safety Data Sheet is correct to the best of Manufacturer's knowledge, information and belief at the date of its publication; however, it is provided only as a guidance for safe handling, use, processing, storage, transportation, disposal and release of the Product. No warranties of any kind, either expressed or implied, including warranties of merchantability or fitness for a particular purpose, are made with respect to the Product or the information provided herein, or that the Product or information herein may be used without infringing the intellectual property rights of others. The information provided in this Safety Data Sheet relates only to the specific Product designated and may not be valid if the Product is used in combination with other materials or in any other process, unless specified herein. The user assumes all risk and liability for loss, injury, damage or expense due to any use, handling, storage or disposal of the Product, and Manufacturer recommends that the user conducts its own tests of the Product to determine suitability of the Product for user's particular use.

Revision information

Physical & Chemical Properties: Multiple Properties
Transport Information: Material Transportation Information
Transport information: General information
Regulatory information: US federal regulations