

## 1. Identification

<b>Product identifier</b>	<b>Brandt Bio-Master</b>		
<b>Other means of identification</b>			
<b>Product code</b>	32055		
<b>Recommended use</b>	Agricultural/ Horticultural Use- Micronutrient Fertilizer- Refer to product label.		
<b>Recommended restrictions</b>	Refer to product label.		
<b>Manufacturer/Importer/Supplier/Distributor information</b>			
<b>Manufacturer</b>			
<b>Company name</b>	Brandt Consolidated, Inc.		
<b>Address</b>	2935 South Koke Mill Road Springfield, IL 62711 United States		
<b>Telephone</b>	Corporate Office	1-217-547-5800	
<b>Website</b>	www.brandt.co		
<b>E-mail</b>	msds@brandt.co		
<b>Contact person</b>	EH&S / Regulatory Department		
<b>Emergency phone number</b>	CHEMTREC (24 hours): USA, Canada, Puerto Rico 1-800-424-9300 Virgin Islands 1-800-424-9300 International Maritime +1 (703) 527-3887		

## 2. Hazard(s) identification

<b>Physical hazards</b>	Not classified.	
<b>Health hazards</b>	Reproductive toxicity	Category 2
<b>Environmental hazards</b>	Not classified.	
<b>OSHA defined hazards</b>	Not classified.	

### Label elements



<b>Signal word</b>	Warning
<b>Hazard statement</b>	Suspected of damaging fertility or the unborn child.
<b>Precautionary statement</b>	
<b>Prevention</b>	Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Wear protective gloves/protective clothing/eye protection/face protection.
<b>Response</b>	If exposed or concerned: Get medical advice/attention.
<b>Storage</b>	Store locked up.
<b>Disposal</b>	Dispose of contents/container in accordance with local/regional/national/international regulations.
<b>Hazard(s) not otherwise classified (HNOC)</b>	None known.
<b>Supplemental information</b>	None.

## 3. Composition/information on ingredients

### Mixtures

Chemical name	Common name and synonyms	CAS number	%
Ferric Ammonium EDTA		21265-50-9	1 - < 3*
Manganese Sulfate, monohydrate		10034-96-5	1 - < 3*
Zinc Sulfate		7733-02-0	1 - < 3*

Chemical name	Common name and synonyms	CAS number	%
Disodium Octaborate Tetrahydrate		12008-41-2	< 1*
Ammonium Hydroxide		1336-21-6	0.003
Other components below reportable levels			90 - 100

#### 4. First-aid measures

<b>Inhalation</b>	Move to fresh air. Call a physician if symptoms develop or persist.
<b>Skin contact</b>	Wash off with soap and water. Get medical attention if irritation develops and persists.
<b>Eye contact</b>	Rinse with water. Get medical attention if irritation develops and persists.
<b>Ingestion</b>	Rinse mouth. Get medical attention if symptoms occur.
<b>Most important symptoms/effects, acute and delayed</b>	Direct contact with eyes may cause temporary irritation.
<b>Indication of immediate medical attention and special treatment needed</b>	Provide general supportive measures and treat symptomatically. Keep victim under observation. Symptoms may be delayed.
<b>General information</b>	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.

#### 5. Fire-fighting measures

<b>Suitable extinguishing media</b>	Water fog. Foam. Dry chemical powder. Carbon dioxide (CO <sub>2</sub> ).
<b>Unsuitable extinguishing media</b>	Do not use water jet as an extinguisher, as this will spread the fire.
<b>Specific hazards arising from the chemical</b>	During fire, gases hazardous to health may be formed.
<b>Special protective equipment and precautions for firefighters</b>	Self-contained breathing apparatus and full protective clothing must be worn in case of fire.
<b>Fire fighting equipment/instructions</b>	Move containers from fire area if you can do so without risk.
<b>Specific methods</b>	Use standard firefighting procedures and consider the hazards of other involved materials.
<b>General fire hazards</b>	No unusual fire or explosion hazards noted.

#### 6. Accidental release measures

<b>Personal precautions, protective equipment and emergency procedures</b>	Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Wear appropriate protective equipment and clothing during clean-up. Ensure adequate ventilation. Local authorities should be advised if significant spillages cannot be contained. For personal protection, see section 8 of the SDS.
<b>Methods and materials for containment and cleaning up</b>	Large Spills: Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. 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. For waste disposal, see section 13 of the SDS.
<b>Environmental precautions</b>	Avoid discharge into drains, water courses or onto the ground.

#### 7. Handling and storage

<b>Precautions for safe handling</b>	Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Avoid prolonged exposure. Pregnant or breastfeeding women must not handle this product. Should be handled in closed systems, if possible. Provide adequate ventilation. Wear appropriate personal protective equipment. Observe good industrial hygiene practices.
<b>Conditions for safe storage, including any incompatibilities</b>	Store locked up. Store in tightly closed container. Store away from incompatible materials (see Section 10 of the SDS).

#### 8. Exposure controls/personal protection

##### Occupational exposure limits

The following constituents are the only constituents of the product which have a PEL, TLV or other recommended exposure limit. At this time, the other constituents have no known exposure limits.

**US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)**

Components	Type	Value
Ammonium Hydroxide (CAS 1336-21-6)	PEL	35 mg/m <sup>3</sup>
		50 ppm
Manganese Sulfate, monohydrate (CAS 10034-96-5)	Ceiling	5 mg/m <sup>3</sup>

**US. ACGIH Threshold Limit Values**

Components	Type	Value	Form
Ammonium Hydroxide (CAS 1336-21-6)	STEL	35 ppm	
	TWA	25 ppm	
Disodium Octaborate Tetrahydrate (CAS 12008-41-2)	STEL	6 mg/m <sup>3</sup>	Inhalable fraction.
	TWA	2 mg/m <sup>3</sup>	Inhalable fraction.
Manganese Sulfate, monohydrate (CAS 10034-96-5)	TWA	0.1 mg/m <sup>3</sup>	Inhalable fraction.
		0.02 mg/m <sup>3</sup>	Respirable fraction.

**US. NIOSH: Pocket Guide to Chemical Hazards**

Components	Type	Value	Form
Ammonium Hydroxide (CAS 1336-21-6)	STEL	27 mg/m <sup>3</sup>	
		35 ppm	
	TWA	18 mg/m <sup>3</sup> 25 ppm	
Manganese Sulfate, monohydrate (CAS 10034-96-5)	STEL	3 mg/m <sup>3</sup>	Fume.
	TWA	1 mg/m <sup>3</sup>	Fume.

**Biological limit values**

No biological exposure limits noted for the ingredient(s).

**Appropriate engineering controls**

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.

**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** 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**

Observe any medical surveillance requirements. 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**

<b>Appearance</b>	Liquid.
<b>Physical state</b>	Liquid.
<b>Form</b>	Liquid.
<b>Color</b>	Black.
<b>Odor</b>	Seaweed odor

<b>Odor threshold</b>	Not available.
<b>pH</b>	Not available.
<b>Melting point/freezing point</b>	3.2 °F (-16 °C) estimated
<b>Initial boiling point and boiling range</b>	> 230 °F (> 110 °C)
<b>Flash point</b>	Not available.
<b>Evaporation rate</b>	0.9
<b>Flammability (solid, gas)</b>	Not applicable.
<b>Upper/lower flammability or explosive limits</b>	
<b>Flammability limit - lower (%)</b>	Not available.
<b>Flammability limit - upper (%)</b>	Not available.
<b>Explosive limit - lower (%)</b>	Not available.
<b>Explosive limit - upper (%)</b>	Not available.
<b>Vapor pressure</b>	0.00001 hPa estimated
<b>Vapor density</b>	Not available.
<b>Relative density</b>	1.29 g/cm <sup>3</sup> (typical)
<b>Solubility(ies)</b>	
<b>Solubility (water)</b>	89 %
<b>Partition coefficient (n-octanol/water)</b>	Not available.
<b>Auto-ignition temperature</b>	Not available.
<b>Decomposition temperature</b>	Not available.
<b>Viscosity</b>	Not available.
<b>Other information</b>	
<b>Explosive properties</b>	Not explosive.
<b>Oxidizing properties</b>	Not oxidizing.
<b>Percent volatile</b>	59.05 % estimated
<b>Pounds per gallon</b>	10.8 lb/gal (typical)

## 10. Stability and reactivity

<b>Reactivity</b>	The product is stable and non-reactive under normal conditions of use, storage and transport.
<b>Chemical stability</b>	Material is stable under normal conditions.
<b>Possibility of hazardous reactions</b>	No dangerous reaction known under conditions of normal use.
<b>Conditions to avoid</b>	Contact with incompatible materials.
<b>Incompatible materials</b>	Strong oxidizing agents.
<b>Hazardous decomposition products</b>	No hazardous decomposition products are known.

## 11. Toxicological information

### Information on likely routes of exposure

<b>Inhalation</b>	Prolonged inhalation may be harmful.
<b>Skin contact</b>	Knowledge about health hazard is incomplete.
<b>Eye contact</b>	Knowledge about health hazard is incomplete.
<b>Ingestion</b>	Expected to be a low ingestion hazard.

**Symptoms related to the physical, chemical and toxicological characteristics** Direct contact with eyes may cause temporary irritation.

### Information on toxicological effects

**Acute toxicity** Not known.

Product	Species	Test Results
Brandt Bio-Master		
<b>Acute</b>		
<b>Dermal</b>		
LD50	Rat	48870 mg/kg
<b>Inhalation</b>		
LD50	Rat	233 mg/l
<b>Oral</b>		
LD50	Rat	17620 mg/kg
Components	Species	Test Results
Ammonium Hydroxide (CAS 1336-21-6)		
<b>Acute</b>		
<b>Oral</b>		
LD50	Rat	350 mg/kg
Disodium Octaborate Tetrahydrate (CAS 12008-41-2)		
<b>Acute</b>		
<b>Dermal</b>		
LD50	Rabbit	> 2000 mg/kg
<b>Oral</b>		
LD50	Rat	2550 mg/kg
Manganese Sulfate, monohydrate (CAS 10034-96-5)		
<b>Acute</b>		
<b>Oral</b>		
LD50	Rat	2150 mg/kg
Zinc Sulfate (CAS 7733-02-0)		
<b>Acute</b>		
<b>Dermal</b>		
LD50	Rat	> 2000 mg/kg
<b>Oral</b>		
LD50	Rat	920 mg/kg 623 mg/kg
<b>Skin corrosion/irritation</b>	Due to partial or complete lack of data the classification is not possible.	
<b>Serious eye damage/eye irritation</b>	Due to partial or complete lack of data the classification is not possible.	
<b>Respiratory or skin sensitization</b>		
<b>Respiratory sensitization</b>	Due to partial or complete lack of data the classification is not possible.	
<b>Skin sensitization</b>	Due to partial or complete lack of data the classification is not possible.	
<b>Germ cell mutagenicity</b>	Due to partial or complete lack of data the classification is not possible.	
<b>Carcinogenicity</b>	Due to partial or complete lack of data the classification is not possible.	
<b>IARC Monographs. Overall Evaluation of Carcinogenicity</b>		
Not listed.		
<b>OSHA Specifically Regulated Substances (29 CFR 1910.1001-1053)</b>		
Not listed.		
<b>US. National Toxicology Program (NTP) Report on Carcinogens</b>		
Not listed.		
<b>Reproductive toxicity</b>	Suspected of damaging fertility or the unborn child.	
<b>Specific target organ toxicity - single exposure</b>	Due to partial or complete lack of data the classification is not possible.	
<b>Specific target organ toxicity - repeated exposure</b>	Due to partial or complete lack of data the classification is not possible.	
<b>Aspiration hazard</b>	Due to partial or complete lack of data the classification is not possible.	
<b>Chronic effects</b>	Prolonged inhalation may be harmful.	

## 12. Ecological information

**Ecotoxicity** The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Product		Species	Test Results
Brandt Bio-Master			
<b>Aquatic</b>			
Crustacea	EC50	Daphnia	305.4662 mg/l, 48 hours
Fish	LC50	Fish	544.2468 mg/l, 96 hours
<b>Components</b>			
Ammonium Hydroxide (CAS 1336-21-6)			
<b>Aquatic</b>			
Fish	LC50	Western mosquitofish ( <i>Gambusia affinis</i> )	15 mg/l, 96 hours
Disodium Octaborate Tetrahydrate (CAS 12008-41-2)			
<b>Aquatic</b>			
<i>Acute</i>			
Crustacea	LC50	Daphnia magna	619 mg/l
Fish	LC50	Pimephales promelas	370 mg/l
Manganese Sulfate, monohydrate (CAS 10034-96-5)			
<b>Aquatic</b>			
Crustacea	EC50	Water flea ( <i>Daphnia obtusa</i> )	30.8 - 44.1 mg/l, 48 hours
Fish	LC50	Fathead minnow ( <i>Pimephales promelas</i> )	36.9 mg/l, 96 hours 29.7 - 52.7 mg/l, 192 hours
Zinc Sulfate (CAS 7733-02-0)			
<b>Aquatic</b>			
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 0.168 - 0.25 mg/l, 96 hours
		Fish ( <i>Lepidocephalichthyes guntea</i> )	76 - 118.8 mg/l, 24 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 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. 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.

## 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.

**Toxic Substances Control Act (TSCA)****TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)**

Not regulated.

**CERCLA Hazardous Substance List (40 CFR 302.4)**

Ammonium Hydroxide (CAS 1336-21-6) 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 1910.1001-1053)**

Not listed.

**Superfund Amendments and Reauthorization Act of 1986 (SARA)****SARA 302 Extremely hazardous substance**

Not listed.

**SARA 311/312 Hazardous chemical** Yes

**Classified hazard categories** Reproductive toxicity

**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**

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)** Contains component(s) regulated under the Safe Drinking Water Act.

**US state regulations****California Proposition 65**

**WARNING:** This product can expose you to chemicals including arsenic, cadmium, and lead, which are known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov).

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

Disodium Octaborate Tetrahydrate (CAS 12008-41-2)

**International Inventories**

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

Country(s) or region	Inventory name	On inventory (yes/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)	No
Taiwan	Taiwan Chemical Substance Inventory (TCSI)	Yes
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).

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

**Issue date** 03-10-2017

**Revision date** 07-23-2019

**Version #** 04

**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** This document has undergone significant changes and should be reviewed in its entirety.