

1. Identification

Product identifier Manni-Plex Ultra Turf
Other means of identification
Product code 28130
Recommended use Agriculture / Horticulture - Liquid Micronutrient Fertilizer - Refer to Product Label
Recommended restrictions None known.

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

Company name Brandt Consolidated, Inc.
Address 2935 South Koke Mill Road
Springfield, IL 62711
United States
Telephone Corporate Office 1-217-547-5800
Website www.brandt.co
E-mail msds@brandt.co
Contact person EH&S / Regulatory Department
Emergency phone number Not available.
CHEMTREC (24 hours):
USA, Canada, Puerto Rico 1-800-424-3900
Virgin Islands 1-800-424-3900
International Maritime +1 (703) 527-3887

2. Hazard(s) identification

Physical hazards Not classified.
Health hazards Skin corrosion/irritation Category 2
Serious eye damage/eye irritation Category 2
Environmental hazards Hazardous to the aquatic environment, acute hazard Category 3
Hazardous to the aquatic environment, long-term hazard Category 3
OSHA defined hazards Not classified.
Label elements



Signal word Warning
Hazard statement Causes skin irritation. Causes serious eye irritation. Harmful to aquatic life. Harmful to aquatic life with long lasting effects.
Precautionary statement
Prevention Wash thoroughly after handling. Avoid release to the environment. Wear protective gloves. Wear eye/face protection.
Response If on skin: Wash with plenty of water. If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Specific treatment (see this label). If skin irritation occurs: Get medical advice/attention. If eye irritation persists: Get medical advice/attention. Take off contaminated clothing and wash before reuse.
Storage Store away from incompatible materials.
Disposal Dispose of contents/container in accordance with local/regional/national/international regulations.
Hazard(s) not otherwise classified (HNOC) None known.

Supplemental information

23.03% of the mixture consists of component(s) of unknown acute hazards to the aquatic environment. 23.03% of the mixture consists of component(s) of unknown long-term hazards to the aquatic environment.

3. Composition/information on ingredients**Mixtures**

Chemical name	Common name and synonyms	CAS number	%
Ferrous Sulfate, Monhydrate		17375-41-6	10 - < 20*
Ammonium Nitrate		6484-52-2	5 - < 10*
Potassium Nitrate		7757-79-1	3 - < 5*
Urea		57-13-6	3 - < 5*
DISODIUM OCTABORATE TETRAHYDRATE		12008-41-2	1 - < 3*
Manganese Sulfate, monohydrate		10034-96-5	1 - < 3*
Sodium Molybdate, Dihydrate		10102-40-6	< 1*
Other components below reportable levels			70 - < 80

*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	Remove contaminated clothing. Wash with plenty of soap and water. If skin irritation occurs: Get medical advice/attention. Wash contaminated clothing before reuse.
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. Get medical attention if irritation develops and persists.
Ingestion	Rinse mouth. Get medical attention if symptoms occur.
Most important symptoms/effects, acute and delayed	Severe eye irritation. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Skin irritation. May cause redness and pain.
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	Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

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 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.
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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. Prevent entry into waterways, sewer, basements or confined areas. 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.

Environmental precautions

Avoid release to the environment. Contact local authorities in case of spillage to drain/aquatic environment. Prevent further leakage or spillage if safe to do so. Do not contaminate water. Avoid discharge into drains, water courses or onto the ground.

7. Handling and storage**Precautions for safe handling**

Avoid contact with eyes, skin, and clothing. Avoid prolonged exposure. Provide adequate ventilation. Wear appropriate personal protective equipment. Observe good industrial hygiene practices. Avoid release to the environment. Do not empty into drains.

Conditions for safe storage, including any incompatibilities

Store in original tightly closed container. 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
Sodium Molybdate, Dihydrate (CAS 10102-40-6)	PEL	5 mg/m ³

US. ACGIH Threshold Limit Values

Components	Type	Value	Form
DISODIUM OCTABORATE TETRAHYDRATE (CAS 12008-41-2)	STEL	6 mg/m ³	Inhalable fraction.
Ferrous Sulfate, Monhydrate (CAS 17375-41-6)	TWA	2 mg/m ³	Inhalable fraction.
	TWA	1 mg/m ³	
Manganese Sulfate, monohydrate (CAS 10034-96-5)	TWA	0.1 mg/m ³	Inhalable fraction.
Sodium Molybdate, Dihydrate (CAS 10102-40-6)	TWA	0.02 mg/m ³	Respirable fraction.
		0.5 mg/m ³	Respirable fraction.

US. NIOSH: Pocket Guide to Chemical Hazards

Components	Type	Value	Form
Ferrous Sulfate, Monhydrate (CAS 17375-41-6)	TWA	1 mg/m ³	
Manganese Sulfate, monohydrate (CAS 10034-96-5)	STEL	3 mg/m ³	Fume.
	TWA	1 mg/m ³	Fume.

US. AIHA Workplace Environmental Exposure Level (WEEL) Guides

Components	Type	Value	Form
Urea (CAS 57-13-6)	TWA	10 mg/m ³	Total particulate.

Biological limit values

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

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. Eye wash facilities and emergency shower must be available when handling this product.
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.
Other	Wear appropriate chemical resistant clothing.
Respiratory protection	In case of insufficient ventilation, wear suitable respiratory equipment.
Thermal hazards	Wear appropriate thermal protective clothing, when necessary.
General hygiene considerations	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	Aqueous solution.
Physical state	Liquid.
Form	Liquid.
Color	Dark brown to Amber.
Odor	Sweet.
Odor threshold	Not available.
pH	3 - 5
Salt-Out / Crystallization Temp	Not available.
Melting point/freezing point	Not available.
Initial boiling point and boiling range	392 °F (200 °C) estimated
Flash point	Not available.
Evaporation rate	Not available.
Flammability (solid, gas)	Not available.
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	Not available.
Relative density	1.22 - 1.23 g/cm ³
Solubility(ies)	
Solubility (water)	100 %
Partition coefficient (n-octanol/water)	Not available.
Auto-ignition temperature	Not available.
Decomposition temperature	Not available.
Viscosity	Not available.
Other information	
Density	1.22 - 1.23 g/cm ³
Percent volatile	64.26 % estimated
pH in aqueous solution	5 - 7 (1% Solution)
Pounds per gallon	10.18 - 10.26 lb/gal

Specific gravity 1.22 - 1.23

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	No dangerous reaction known under conditions of normal use.
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

Ingestion Expected to be a low ingestion hazard.

Inhalation Prolonged inhalation may be harmful.

Skin contact Causes skin irritation.

Eye contact Causes serious eye irritation.

Symptoms related to the physical, chemical and toxicological characteristics Severe eye irritation. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Skin irritation. May cause redness and pain.

Information on toxicological effects

Acute toxicity

Product	Species	Test Results
Manni-Plex Ultra Turf (CAS Mixture)		
Acute		
<i>Dermal</i>		
LD50	Sprague-Dawley rat	19230.7695 mg/kg, 14 days estimated
<i>Inhalation</i>		
LC50	Rat	848.7433 mg/l, 4 Hours estimated
<i>Oral</i>		
LD100	Mouse	18597.5605 mg/kg estimated
LD50	Mouse	14615.3848 mg/kg estimated
	Rabbit	24914.5293 mg/kg estimated
	Rat	9880.085 mg/kg, 14 days estimated
	Sprague-Dawley rat	19230.7695 mg/kg, 14 days estimated
<i>Other</i>		
LD100	Mouse	8902.4395 mg/kg estimated
LD50	Mouse	1623.0826 mg/kg estimated

Components	Species	Test Results
Ammonium Nitrate (CAS 6484-52-2)		
Acute		
<i>Inhalation</i>		
LC50	Rat	> 88.8 mg/l, 4 Hours
<i>Oral</i>		
LD50	Rat	2217 mg/kg
DISODIUM OCTABORATE TETRAHYDRATE (CAS 12008-41-2)		
Acute		
<i>Dermal</i>		
LD50	Rabbit	> 2000 mg/kg
<i>Oral</i>		
LD50	Guinea pig	5300 mg/kg

Components	Species	Test Results
	Rat	> 2000 mg/kg 2 g/kg
Ferrous Sulfate, Monhydrate (CAS 17375-41-6)		
Acute		
<i>Dermal</i>		
LD50	Sprague-Dawley rat	> 2000 mg/kg, 14 days
<i>Oral</i>		
LD50	Dog	600 mg/kg
	Mouse	1520 mg/kg
	Sprague-Dawley rat	> 2000 mg/kg, 14 days
<i>Other</i>		
LD50	Mouse	289 mg/kg
Manganese Sulfate, monohydrate (CAS 10034-96-5)		
Acute		
<i>Oral</i>		
LD100	Mouse	305 mg/kg
<i>Other</i>		
LD100	Mouse	146 mg/kg
LD50	Mouse	64 mg/kg
Potassium Nitrate (CAS 7757-79-1)		
Acute		
<i>Oral</i>		
LD50	Rabbit	1166 mg/kg
Urea (CAS 57-13-6)		
Acute		
<i>Oral</i>		
LD50	Rat	8471 mg/kg
	Sheep	28500 mg/kg

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

Skin corrosion/irritation	Causes skin 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	This product is not considered to be a carcinogen by IARC, ACGIH, NTP, or OSHA.
OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)	
Not listed.	
Reproductive toxicity	This product is not expected to cause reproductive or developmental effects.
Specific target organ toxicity - single exposure	Not classified.
Specific target organ toxicity - repeated exposure	Not classified.
Aspiration hazard	Not available.
Chronic effects	Prolonged inhalation may be harmful.

12. Ecological information

Ecotoxicity	Harmful to aquatic life with long lasting effects. Accumulation in aquatic organisms is expected.
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Product	Species		Test Results
Manni-Plex Ultra Turf (CAS Mixture)			
Aquatic			
Crustacea	EC50	Daphnia	386.7974 mg/l, 48 hours estimated
Fish	LC50	Fish	139.6648 mg/l, 96 hours estimated
Components			
Species			
Test Results			
Ferrous Sulfate, Monhydrate (CAS 17375-41-6)			
Aquatic			
Crustacea	EC50	Amphipod (Crangonyx pseudogracilis)	114 - 211 mg/l, 48 hours 81.8 - 117 mg/l, 96 hours
Fish	LC50	Water flea (Daphnia magna)	6.15 - 9.26 mg/l, 48 hours
		Carp (Cyprinus carpio)	1.22 mg/l, 96 hours
		Chameleon goby (Tridentiger trigonocephalus)	86.8 mg/l, 24 hours
		Mozambique tilapia (Tilapia mossambica)	47 mg/l, 96 hours 33 mg/l, 96 hours
		Western mosquitofish (Gambusia affinis)	20 mg/l, 4 days
Manganese Sulfate, monohydrate (CAS 10034-96-5)			
Aquatic			
Crustacea	EC50	Water flea (Daphnia magna)	7.09 - 9.36 mg/l, 48 hours
Fish	LC50	Fathead minnow (Pimephales promelas)	24.3 - 38.9 mg/l, 96 hours
Potassium Nitrate (CAS 7757-79-1)			
Aquatic			
Fish	LC50	Bluegill (Lepomis macrochirus)	1200 mg/l, 96 hours
<i>Acute</i>			
Fish	LC50	Fish	1378 - 3000 mg/l
Sodium Molybdate, Dihydrate (CAS 10102-40-6)			
Aquatic			
Crustacea	EC50	Tubificid worm (Tubifex tubifex)	42.48 - 65.64 mg/l, 48 hours
Fish	LC50	Striped bass (Morone saxatilis)	> 79.8 mg/l, 96 hours
Urea (CAS 57-13-6)			
Aquatic			
Crustacea	EC50	Water flea (Daphnia magna)	3910 mg/l, 48 hours
Fish	LC50	Carp (Leuciscus idus melanotus)	> 10000 mg/l, 48 hours
		Guppy (Poecilia reticulata)	16200 - 18300 mg/l, 96 hours
		Harlequinfish, red rasbora (Rasbora heteromorpha)	12000 mg/l, 96 hours
		Mozambique tilapia (Tilapia mossambica)	590 - 730 mg/l, 96 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 No data available.

Partition coefficient n-octanol / water (log Kow)

Urea -2.11

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. One or more components are not listed on TSCA.
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TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated.

CERCLA Hazardous Substance List (40 CFR 302.4)

Ferrous Sulfate, Monhydrate (CAS 17375-41-6)	Listed.
Manganese Sulfate, monohydrate (CAS 10034-96-5)	Listed.

SARA 304 Emergency release notification

Not regulated.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not listed.

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories	Immediate Hazard - Yes Delayed Hazard - No Fire Hazard - No Pressure Hazard - No Reactivity Hazard - No
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SARA 302 Extremely hazardous substance

Not listed.

SARA 311/312 Hazardous chemical No

SARA 313 (TRI reporting)

Chemical name	CAS number	% by wt.
Potassium Nitrate	7757-79-1	3 - < 5
Manganese Sulfate, monohydrate	10034-96-5	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) Not regulated.

US state regulations

US. Massachusetts RTK - Substance List

Ammonium Nitrate (CAS 6484-52-2)
Ferrous Sulfate, Monhydrate (CAS 17375-41-6)
Potassium Nitrate (CAS 7757-79-1)

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

Ammonium Nitrate (CAS 6484-52-2)
DISODIUM OCTABORATE TETRAHYDRATE (CAS 12008-41-2)
Ferrous Sulfate, Monhydrate (CAS 17375-41-6)
Manganese Sulfate, monohydrate (CAS 10034-96-5)
Potassium Nitrate (CAS 7757-79-1)

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

Ammonium Nitrate (CAS 6484-52-2)
Potassium Nitrate (CAS 7757-79-1)

US. Rhode Island RTK

Ammonium Nitrate (CAS 6484-52-2)
Ferrous Sulfate, Monhydrate (CAS 17375-41-6)
Manganese Sulfate, monohydrate (CAS 10034-96-5)
Potassium Nitrate (CAS 7757-79-1)

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. California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65): This material is not known to contain any chemicals currently listed as carcinogens or reproductive toxins.

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)	No
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	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)	No
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	11-06-2014
Version #	01
Disclaimer	The information in the sheet was written based on the best knowledge and experience currently available.