SAFETY DATA SHEET

1. Identification

Product identifier          Brandt Ferrous Sulfate - Crystal
Other means of identification
  Product code               34003
Recommended use             Agriculture / Horticulture - Micronutrient - Refer to Product Label
Recommended restrictions    None known.
Manufacturer/Importer/Supplier/Distributor information
  Manufacturer               Brandt Consolidated, Inc.
  Address                    2935 South Koke Mill Road
                              Springfield, IL 62711
  Company name               United States
  Contact person             EHS / Regulatory Department
  Website                    www.brandt.co
  E-mail                     msds@brandt.co
  Telephone                  1-217-547-5800
  Emergency phone number     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              Acute toxicity, oral Category 4
                              Skin corrosion/irritation Category 2
                              Serious eye damage/eye irritation Category 2
Environmental hazards       Not classified.
OSHA defined hazards        Not classified.
Label elements

Signal word                 Warning
Hazard statement            Harmful if swallowed. Causes skin irritation. Causes serious eye irritation.
Precautionary statement
  Prevention                Wash thoroughly after handling. Do not eat, drink or smoke when using this product. Wear protective gloves. Wear eye/face protection.
  Response                  If swallowed: Call a poison center/doctor if you feel unwell. 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). Rinse mouth. 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    None.

Material name: Brandt Ferrous Sulfate - Crystal  
Version #: 04  Revision date: 05-21-2015  Issue date: 02-27-2014
3. Composition/information on ingredients

<table>
<thead>
<tr>
<th>Substances</th>
<th>Chemical name</th>
<th>Common name and synonyms</th>
<th>CAS number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>FERROUS SULFATE</td>
<td>90 - 100</td>
<td>7782-63-0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Water</td>
<td>10</td>
<td>7732-18-5</td>
<td>10</td>
</tr>
</tbody>
</table>

*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. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs. Get medical advice/attention if you feel unwell.

**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 warm. 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. 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. Use water spray to cool unopened containers.

**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.

**Methods and materials for containment and cleaning up**
Stop the flow of material, if this is without risk. Prevent entry into waterways, sewer, basements or confined areas. Following product recovery, flush area with water. For waste disposal, see section 13 of the SDS.

**Environmental precautions**
Avoid discharge into drains, water courses or onto the ground.
If the release of this substance is reportable under CERCLA section 103, the National Response Center must be notified immediately at 800-424-8802.

7. Handling and storage

**Precautions for safe handling**
Avoid contact with eyes, skin, and clothing. Do not taste or swallow. When using, do not eat, drink or smoke. Provide adequate ventilation. Wear appropriate personal protective equipment. Wash hands thoroughly after handling. Observe good industrial hygiene practices.

**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: No exposure limits noted for ingredient(s).

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: Face shield is recommended. 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: Keep away from food and drink. 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: Crystalline. Granular.

Physical state: Solid.

Form: Solid. Crystalline.

Color: Blue green

Odor: Not available.

Odor threshold: Not available.

pH: Not available.

Salt-Out / Crystallization Temp: Not available.

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:

Flammability limit - lower (%): Not available.

Flammability limit - upper (%): Not available.

Explosive limit - lower (%): Not available.

Explosive limit - upper (%): Not available.

Vapor pressure: < 0.0000001 kPa at 25 °C

Vapor density: Not available.

Relative density: Not available.

Solubility(ies):

Solubility (water): 48 g/l (typical)

Partition coefficient (n-octanol/water): Not available.

Auto-ignition temperature: Not available.

Decomposition temperature: Not available.

Viscosity: Not available.
Other information

- **Bulk density**: 55 lb/ft³ (typical)
- **Molecular formula**: Fe₂(H₂O)₄SO₄·7H₂O
- **pH in aqueous solution**: 3.5 - 5 (5% solution)

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**: Alkalies. Arsenic trioxide and sodium nitrate: spontaneously combustible mixture.

**Hazardous decomposition products**: Thermal decomposition products may include toxic sulfur oxides.

11. Toxicological information

**Information on likely routes of exposure**

- **Ingestion**: Harmful if swallowed.
  
  **Brandt Ferrous Sulfate - Crystal**: 1520 mg/kg
  
  **Species**: Mouse

- **Inhalation**: No adverse effects due to inhalation are expected.

- **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**: Harmful if swallowed.

<table>
<thead>
<tr>
<th>Product</th>
<th>Species</th>
<th>Test Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brandt Ferrous Sulfate - Crystal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acute</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oral</td>
<td>Mouse</td>
<td>1520 mg/kg</td>
</tr>
<tr>
<td>LD50</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* 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.


- **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**: May cause damage to organs (liver, kidneys, circulatory, cardiovascular and central nervous system) through prolonged or repeated exposure.

**Aspiration hazard**: Not available.

**Further information**: Interactions with medicines may cause adverse effects.
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.

Persistence and degradability
No data is available on the degradability of this product.

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
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

General
Not DOT regulated in domestic (USA ground) transportation in package sizes less than 1,111 lbs.

DOT Shipping Notes: 40 CFR 172.504(f)(9) For Class 9, a CLASS 9 placard is not required for domestic (USA ground) transportation, however shipments with packaging exceeding the Reportable Quantity (RQ) or bulk packaging must be marked with the appropriate identification number on a CLASS 9 placard, an orange panel, or a white square-on-point display configuration as required. Since the Class 9 placard is not required (although it may be used) the hazardous material endorsement is also not required on a Commercial Drivers License.

DOT Basic shipping requirements:
- UN number: UN3077
- Proper shipping name: Environmentally hazardous substances, solid, n.o.s. (FERROUS SULFATE RQ = 1111 lbs)
- Hazard class: 9
- Packing group: III
- Special precautions: Read safety instructions, SDS and emergency procedures before handling.

Additional information:
- Special provisions: 8, 146, 335, A112, B54, IB8, IP3, N20, T1, TP33
- Packaging exceptions: 155
- Packaging non bulk: 213
- Packaging bulk: 240
- Reportable quantity: 1000

Notes
DOT Shipping Notes: 40 CFR 172.504(f)(9) For Class 9, a CLASS 9 placard is not required for domestic (USA ground) transportation, however shipments with packaging sizes exceeding the Reportable Quantity (RQ) or bulk packaging must be marked with the appropriate identification number on a CLASS 9 placard, an orange panel, or a white square-on-point display configuration as required. Since the Class 9 placard is not required (although it may be used) the hazardous material endorsement is also not required on a Commercial Drivers License.

IATA
Not regulated as dangerous goods.

IMDG
Not regulated as dangerous goods.

General information
Not DOT regulated in domestic (USA ground) transportation in package sizes less than 1,111 lbs.
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.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)
Not regulated.

CERCLA Hazardous Substance List (40 CFR 302.4)
FERROUS SULFATE (CAS 7782-63-0) 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

SARA 302 Extremely hazardous substance
Not listed.

SARA 311/312 Hazardous chemical
Yes

SARA 313 (TRI reporting)
Not regulated.

Other federal regulations

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List
Not regulated.

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)
Not regulated.

Safe Drinking Water Act (SDWA)
Not regulated.

Food and Drug Administration (FDA)
Total food additive
Direct food additive
GRAS food additive

US state regulations

US. Massachusetts RTK - Substance List
FERROUS SULFATE (CAS 7782-63-0)

US. New Jersey Worker and Community Right-to-Know Act
Not listed.

US. Pennsylvania Worker and Community Right-to-Know Law
FERROUS SULFATE (CAS 7782-63-0)

US. Rhode Island RTK
FERROUS SULFATE (CAS 7782-63-0)

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.
### International Inventories

<table>
<thead>
<tr>
<th>Country(s) or region</th>
<th>Inventory name</th>
<th>On inventory (yes/no)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>Australian Inventory of Chemical Substances (AICS)</td>
<td>Yes</td>
</tr>
<tr>
<td>Canada</td>
<td>Domestic Substances List (DSL)</td>
<td>No</td>
</tr>
<tr>
<td>Canada</td>
<td>Non-Domestic Substances List (NDSL)</td>
<td>No</td>
</tr>
<tr>
<td>China</td>
<td>Inventory of Existing Chemical Substances in China (IECSC)</td>
<td>Yes</td>
</tr>
<tr>
<td>Europe</td>
<td>European Inventory of Existing Commercial Chemical Substances (EINECS)</td>
<td>Yes</td>
</tr>
<tr>
<td>Europe</td>
<td>European List of Notified Chemical Substances (ELINCS)</td>
<td>No</td>
</tr>
<tr>
<td>Japan</td>
<td>Inventory of Existing and New Chemical Substances (ENCS)</td>
<td>No</td>
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<tr>
<td>Korea</td>
<td>Existing Chemicals List (ECL)</td>
<td>No</td>
</tr>
<tr>
<td>New Zealand</td>
<td>New Zealand Inventory</td>
<td>Yes</td>
</tr>
<tr>
<td>Philippines</td>
<td>Philippine Inventory of Chemicals and Chemical Substances (PICCS)</td>
<td>Yes</td>
</tr>
<tr>
<td>United States &amp; Puerto Rico</td>
<td>Toxic Substances Control Act (TSCA) Inventory</td>
<td>No</td>
</tr>
</tbody>
</table>

*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).

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

- **Issue date**: 02-27-2014
- **Revision date**: 05-21-2015
- **Version #**: 04
- **Disclaimer**: The information in the sheet was written based on the best knowledge and experience currently available.