SECTION 1: IDENTIFICATION

1.1. Product Identifier
Product Form: Mixture
Product Name: ALNICO 3

1.2. Intended Use of the Product
Use of the substance/mixture: Cast and Sintered Permanent Magnets

1.3. Name, Address, and Telephone of the Responsible Party
Manufacturer
Arnold Magnetic Technologies
770 Linden Ave.
Rochester NY, 14625
800-593-9127
www.arnoldmagnetics.com

1.4. Emergency Telephone Number
Emergency Number: Within USA and Canada 1-800-424-9300 or +1 703-527-3887 (collect calls accepted)

SECTION 2: HAZARDS IDENTIFICATION

2.1. Classification of the Substance or Mixture
Classification (GHS-US)
Not classified

2.2. Label Elements
GHS-US Labeling
No labeling applicable

2.3. Other Hazards
Under normal conditions of use and handling in the solid form, harmful substances cannot be released, nor is the solid metal piece considered flammable. Much of the information provided in this SDS is for situations of use in which hazardous exposures may occur, such as in welding applications or for metals in powder form.

2.4. Unknown Acute Toxicity (GHS-US)
No data available

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1. Substance
Not applicable

3.2. Mixture

<table>
<thead>
<tr>
<th>Name</th>
<th>Product Identifier</th>
<th>%</th>
<th>Classification (GHS-US)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iron</td>
<td>(CAS No) 7439-89-6</td>
<td>57 - 62</td>
<td>Comb. Dust Flam. Sol. 1, H228 Self-heat. 1, H251</td>
</tr>
<tr>
<td>Nickel</td>
<td>(CAS No) 7440-02-0</td>
<td>23 - 27</td>
<td>Skin Sens. 1, H317 Carc. 2, H351 STOT RE 1, H372 Aquatic Acute 1, H400 Aquatic Chronic 3, H412</td>
</tr>
<tr>
<td>Aluminum</td>
<td>(CAS No) 7429-90-5</td>
<td>10 - 13</td>
<td>Comb. Dust Flam. Sol. 1, H228 Water-react. 2, H261</td>
</tr>
<tr>
<td>Copper</td>
<td>(CAS No) 7440-50-8</td>
<td>2 - 4</td>
<td>Comb. Dust Aquatic Acute 1, H400 Aquatic Chronic 3, H412</td>
</tr>
</tbody>
</table>

Full text of H-phrases: see section 16

SECTION 4: FIRST AID MEASURES

4.1. Description of First Aid Measures
First-aid Measures General: If medical advice is needed, have product SDS at hand.
First-aid Measures After Inhalation: If inhaled, remove to fresh air and keep at rest in a position comfortable for breathing. Obtain medical attention if breathing difficulty persists.

First-aid Measures After Skin Contact: Wash immediately with plenty of soap and water. Rinse with plenty of water. Remove contaminated clothing. Wash contaminated clothing before reuse. Obtain medical attention if irritation develops or persists.

First-aid Measures After Eye Contact: Immediately rinse with water for a prolonged period (at least 15 minutes) while holding the eyelids wide open. Remove contact lenses, if present and easy to do. Continue rinsing. Obtain medical attention if irritation develops or persists.

First-aid Measures After Ingestion: If swallowed, do not induce vomiting: seek medical advice immediately and show this SDS.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms/Injuries: The primary acute health hazard associated with this product would be the potential for exposure to fumes during metal processing operations. Under normal conditions of use not expected to present a significant hazard. During processing or physical alteration, flakes or powder cause irritation of the respiratory tract, eyes, skin, and are harmful. Molten material may release toxic, and irritating fumes.

Symptoms/Injuries After Inhalation: During processing, inhalation of fumes may cause lung inflammation and injury with symptoms of chest pains, chills, cough, headache, and diarrhea. Inhalation of dusts and fumes can cause metal fume fever. Symptoms can include a metallic or sweet taste in the mouth, sweating, shivering, headache, throat irritation, fever, chills, thirstiness, muscle aches, nausea, vomiting, weakness, fatigue, and shortness of breath.

Symptoms/Injuries After Skin Contact: During metal processing, dust may cause irritation in skin folds or by contact in combination with tight clothing.

Symptoms/Injuries After Eye Contact: Dust generated from material cutting may cause a slight irritation. Slivers may be generated, which could cause mechanical irritation or injure the eye.

Symptoms/Injuries After Ingestion: If a large quantity has been ingested: Gastrointestinal irritation.

Chronic Symptoms: Aluminum: Inhalation of finely divided aluminum powder may cause pulmonary fibrosis. Nickel: May cause a form of dermatitis known as nickel itch and intestinal irritation, which may cause disorders, convulsions and asphyxia. Inhalation of Nickel compounds has been shown in studies to provide an increased incidence of cancer of the nasal cavity, lung and possibly larynx in nickel refinery workers. Copper: Overexposure to fumes may cause metal fume fever (chills, muscle aches, nausea, fever, dry throat, cough, weakness, lassitude); metallic or sweet taste; discoloration of skin and hair. Tissue damage of mucous membranes may follow chronic dust exposure.

4.3. Indication of Any Immediate Medical Attention and Special Treatment Needed

If medical advice is needed, have product SDS at hand.

SECTION 5: FIRE-FIGHTING MEASURES

5.1. Extinguishing Media

Suitable Extinguishing Media: earth, sand, dry chemical powder or foam.

Unsuitable Extinguishing Media: Water may be ineffective.

5.2. Special Hazards Arising From the Substance or Mixture

Fire Hazard: Dust, chips, or ribbons can be ignited more easily, by an ignition source, by improper machining, or by spontaneous combustion if finely divided and damp.

Explosion Hazard: Product itself is not explosive but if dust is generated, dust clouds suspended in air can be explosive.

Reactivity: Hazardous reactions will not occur under normal conditions.

5.3. Advice for Firefighters

Firefighting Instructions: Do not breathe fumes from fires or vapours from decomposition. Keep upwind.

Protection During Firefighting: Firefighters must use full bunker gear including NIOSH-approved positive-pressure self-contained breathing apparatus to protect against potential hazardous combustion and decomposition products.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1. Personal Precautions, Protective Equipment and Emergency Procedures

6.1.1. For Non-emergency Personnel

Protective Equipment: Wear eye protection.

Emergency Procedures: Avoid creating or spreading dust. Eliminate ignition sources.

6.1.2. For Emergency Responders

Protective Equipment: Safety glasses.


6.2. Environmental Precautions

Contain any spills with dikes or absorbents to prevent migration and entry into sewers or streams.

6.3. Methods and Material for Containment and Cleaning Up

For Containment: Contain and collect as any solid.
Methods for Cleaning Up: Avoid generation of dust during clean-up of spills. Take up mechanically (sweeping, shovelling) and collect in suitable container for disposal. Vacuum must be fitted with HEPA filter to prevent release of particulates during clean-up. Use only non-sparking tools. Use explosion-proof equipment.

6.4. Reference to Other Sections
See heading 8, Exposure Controls and Personal Protection.

SECTION 7: HANDLING AND STORAGE

7.1. Precautions for Safe Handling
Additional Hazards When Processed: Do not handle until all safety precautions have been read and understood. Fine dust dispersed in air may ignite. 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.

Precautions for Safe Handling: Do not breathe dust. Do not get in eyes, on skin, or on clothing. Avoid creating or spreading dust. Always wash hands after handling the product. Do not eat, drink or smoke when using this product. Ensure there is adequate ventilation. Wear recommended personal protective equipment.

Hygiene Measures: Handle in accordance with good industrial hygiene and safety procedures. Always wash your hands immediately after handling this product, and once again before leaving the workplace. Wash contaminated clothing before reuse. Do not eat, drink or smoke in areas where product is used. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure.

7.2. Conditions for Safe Storage, Including Any Incompatibilities
Storage Conditions: Store in a dry, cool place.


7.3. Specific End Use(s) Cast and Sintered Permanent Magnets

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control Parameters

<table>
<thead>
<tr>
<th></th>
<th>USA ACGIH</th>
<th>USA NIOSH</th>
<th>USA IDLH</th>
<th>USA OSHA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nickel (7440-02-0)</td>
<td>ACGIH TWA (mg/m³)</td>
<td>1.5 mg/m³</td>
<td>0.015 mg/m³</td>
<td>10 mg/m³</td>
</tr>
<tr>
<td></td>
<td>NIOSH REL (TWA) (mg/m³)</td>
<td>0.15 mg/m³</td>
<td>1 mg/m³</td>
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</tr>
<tr>
<td></td>
<td>US IDLH (mg/m³)</td>
<td>10 mg/m³</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>OSHA PEL (TWA) (mg/m³)</td>
<td>1 mg/m³</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Aluminum (7429-90-5)

<table>
<thead>
<tr>
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<th>USA ACGIH</th>
<th>USA NIOSH</th>
<th>USA OSHA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ACGIH TWA (mg/m³)</td>
<td>1 mg/m³</td>
<td>5 mg/m³</td>
</tr>
<tr>
<td></td>
<td>NIOSH REL (TWA) (mg/m³)</td>
<td>5 mg/m³</td>
<td></td>
</tr>
<tr>
<td></td>
<td>OSHA PEL (TWA) (mg/m³)</td>
<td>5 mg/m³</td>
<td></td>
</tr>
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</table>

Copper (7440-50-8)

<table>
<thead>
<tr>
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<th>USA ACGIH</th>
<th>USA NIOSH</th>
<th>USA OSHA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ACGIH TWA (mg/m³)</td>
<td>0.2 mg/m³</td>
<td>0.1 mg/m³</td>
</tr>
<tr>
<td></td>
<td>NIOSH REL (TWA) (mg/m³)</td>
<td>0.015 mg/m³</td>
<td>1 mg/m³</td>
</tr>
<tr>
<td></td>
<td>US IDLH (mg/m³)</td>
<td>100 mg/m³</td>
<td></td>
</tr>
<tr>
<td></td>
<td>OSHA PEL (TWA) (mg/m³)</td>
<td>1 mg/m³</td>
<td></td>
</tr>
</tbody>
</table>

8.2. Exposure Controls

Appropriate Engineering Controls: Ensure adequate ventilation, especially in confined areas. Avoid dust production.

Personal Protective Equipment: Not generally required. The use of personal protective equipment may be necessary as conditions warrant.

Hand Protection: If material is hot, wear thermally resistant protective gloves.

Eye Protection: During metal processing, safety glasses.

Respiratory Protection: During metal processing, if exposure limits are exceeded or irritation is experienced, NIOSH approved respiratory protection should be worn.

Environmental Exposure Controls: Ensure adequate ventilation, especially in confined areas.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on Basic Physical and Chemical Properties

| Physical State | Solid |
| Appearance     | Metallic gray to black castings. |
| Color          | Metallic |
| Odor           | Odorless. |
| Odor Threshold | No data available |
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pH : No data available
Evaporation Rate : No data available
Melting Point : 1200 - 1450 °C (2192 - 2642 °F)
Freezing Point : No data available
Boiling Point : No data available
Flash Point : No data available
Auto-ignition Temperature : No data available
Decomposition Temperature : No data available
Flammability (solid, gas) : No data available
Vapor Pressure : No data available
Relative Vapor Density at 20 °C : No data available
Relative Density : No data available
Density : 6.8 - 7.4 g/cc
Solubility : Water: Insoluble
Partition Coefficient: N-octanol/water : No data available
Viscosity : No data available
Explosive Properties : None.
Oxidizing Properties : None.

9.2. Other Information
No additional information available

SECTION 10: STABILITY AND REACTIVITY

10.1 Reactivity: Hazardous reactions will not occur under normal conditions.
10.2 Chemical Stability: Product is stable.
10.3 Possibility of Hazardous Reactions: Hazardous polymerization will not occur.
10.4 Conditions to Avoid: None known.

SECTION 11: TOXICOLOGICAL INFORMATION

11.1. Information On Toxicological Effects
Acute Toxicity: Not classified. Not classified.

Iron (7439-89-6)
LD50 Oral Rat 98.6 g/kg
ATE (Oral) 98,600.00 mg/kg body weight

Nickel (7440-02-0)
LD50 Oral Rat > 9000 mg/kg

Skin Corrosion/Irritation: Not classified
Serious Eye Damage/Irritation: Not classified.
Respiratory or Skin Sensitization: Not classified. Not classified.
Germ Cell Mutagenicity: Not classified
Carcinogenicity: Not classified.

Nickel (7440-02-0)
IARC group 2B
National Toxicity Program (NTP) Status Reasonably anticipated to be Human Carcinogen.

Reproductive Toxicity: Not classified.
Specific Target Organ Toxicity (Single Exposure): Not classified
Specific Target Organ Toxicity (Repeated Exposure): Not classified.
Aspiration Hazard: Not classified

Symptoms/Injuries After Inhalation: During processing, inhalation of fumes may cause lung inflammation and injury with symptoms of chest pains, chills, cough, headache, and diarrhea. Inhalation of dusts and fumes can cause metal fume fever. Symptoms can include a metallic or sweet taste in the mouth, sweating, shivering, headache, throat irritation, fever, chills, thirstiness, muscle aches, nausea, vomiting, weakness, fatigue, and shortness of breath.
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SECTION 12: ECOLOGICAL INFORMATION

12.1. Toxicity

<table>
<thead>
<tr>
<th>Substance</th>
<th>LC50 Fish 1</th>
<th>EC50 Daphnia 1</th>
<th>LC50 Fish 2</th>
<th>EC50 Daphnia 2</th>
<th>EC50 Other Aquatic Organisms 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nickel (7440-02-0)</td>
<td>100 mg/l (Exposure time: 96 h - Species: Brachydanio rerio)</td>
<td>13 (13 - 200) μg/l (Exposure time: 48h - Species: Ceriodaphnia dubia [static])</td>
<td>1.3 mg/l (Exposure time: 96 h - Species: Cyprinus carpio [semi-static])</td>
<td>1 mg/l (Exposure time: 48 h - Species: Daphnia magna [Static])</td>
<td>0.174 (0.174 - 0.311) mg/l (Exposure time: 96 h - Species: Pseudokirchneriella subcapitata [static])</td>
</tr>
<tr>
<td>Copper (7440-50-8)</td>
<td>&lt;= 0.0068 (0.0068 - 0.0156) mg/l (Exposure time: 96 h - Species: Pimephales promelas)</td>
<td>0.03 mg/l (Exposure time: 48 h - Species: Daphnia magna [Static])</td>
<td>0.0426 (0.0426 - 0.0535) mg/l (Exposure time: 72 h - Species: Pseudokirchneriella subcapitata [static])</td>
<td>0.3 mg/l (Exposure time: 96 h - Species: Pimephales promelas [static])</td>
<td>0.031 (0.031 - 0.054) mg/l (Exposure time: 96 h - Species: Pseudokirchneriella subcapitata [static])</td>
</tr>
</tbody>
</table>

12.2. Persistence and Degradability

<table>
<thead>
<tr>
<th>Substance</th>
<th>Persistence and Degradability</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALNICO 3</td>
<td>Not readily biodegradable.</td>
</tr>
<tr>
<td>Copper (7440-50-8)</td>
<td>Not readily biodegradable.</td>
</tr>
</tbody>
</table>

12.3. Bioaccumulative Potential

No additional information available

12.4. Mobility in Soil

No additional information available

12.5. Other Adverse Effects

No additional information available

SECTION 13: DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

Sewage Disposal Recommendations: Do not empty into drains; dispose of this material and its container in a safe way.

Waste Disposal Recommendations: Dispose of waste material in accordance with all local, regional, national, and international regulations.

SECTION 14: TRANSPORT INFORMATION

In Accordance With ICAO/IATA/IMDG/DOT

14.1. UN Number

Not regulated for transport

14.2. UN Proper Shipping Name

Not regulated for transport

14.3. Additional Information

Not regulated for transport

Transport by Sea

Not regulated for transport

Air Transport

Not regulated for transport

SECTION 15: REGULATORY INFORMATION

15.1 US Federal Regulations
### ALNICO 3

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<table>
<thead>
<tr>
<th><strong>Iron (7439-89-6)</strong></th>
<th>Listed on the United States TSCA (Toxic Substances Control Act) inventory</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Nickel (7440-02-0)</strong></td>
<td>Listed on the United States TSCA (Toxic Substances Control Act) inventory</td>
</tr>
<tr>
<td></td>
<td>Listed on United States SARA Section 313</td>
</tr>
<tr>
<td><strong>RQ (Reportable quantity, section 304 of EPA's List of Lists):</strong></td>
<td>100 lb (only applicable if particles are &lt; 100 µm)</td>
</tr>
<tr>
<td><strong>SARA Section 313 - Emission Reporting</strong></td>
<td>0.1 %</td>
</tr>
<tr>
<td><strong>Aluminum (7429-90-5)</strong></td>
<td>Listed on the United States TSCA (Toxic Substances Control Act) inventory</td>
</tr>
<tr>
<td></td>
<td>Listed on United States SARA Section 313</td>
</tr>
<tr>
<td><strong>SARA Section 313 - Emission Reporting</strong></td>
<td>1.0 % (dust or fume only)</td>
</tr>
<tr>
<td><strong>Copper (7440-50-8)</strong></td>
<td>Listed on the United States TSCA (Toxic Substances Control Act) inventory</td>
</tr>
<tr>
<td></td>
<td>Listed on United States SARA Section 313</td>
</tr>
<tr>
<td><strong>SARA Section 313 - Emission Reporting</strong></td>
<td>1.0 %</td>
</tr>
</tbody>
</table>

#### 15.2 US State Regulations

<table>
<thead>
<tr>
<th><strong>Nickel (7440-02-0)</strong></th>
<th>U.S. - California - Proposition 65 - Carcinogens List</th>
</tr>
</thead>
<tbody>
<tr>
<td>WARNING: This product contains chemicals known to the State of California to cause cancer.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Nickel (7440-02-0)</strong></th>
<th>U.S. - Massachusetts - Right To Know List</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. - New Jersey - Right to Know Hazardous Substance List</td>
<td></td>
</tr>
<tr>
<td>U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List</td>
<td></td>
</tr>
<tr>
<td>U.S. - Pennsylvania - RTK (Right to Know) - Special Hazardous Substances</td>
<td></td>
</tr>
<tr>
<td>U.S. - Pennsylvania - RTK (Right to Know) List</td>
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</table>

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<tr>
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<tr>
<td>U.S. - New Jersey - Right to Know Hazardous Substance List</td>
<td></td>
</tr>
<tr>
<td>U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List</td>
<td></td>
</tr>
<tr>
<td>U.S. - Pennsylvania - RTK (Right to Know) List</td>
<td></td>
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<tbody>
<tr>
<td>U.S. - New Jersey - Right to Know Hazardous Substance List</td>
<td></td>
</tr>
<tr>
<td>U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List</td>
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</tr>
<tr>
<td>U.S. - Pennsylvania - RTK (Right to Know) List</td>
<td></td>
</tr>
</tbody>
</table>

#### SECTION 16: OTHER INFORMATION, INCLUDING DATE OF PREPARATION OR LAST REVISION

**Revision Date** : 09/02/2014

**Other Information** : This document has been prepared in accordance with the SDS requirements of the OSHA Hazard Communication Standard 29 CFR 1910.1200.

**GHS Full Text Phrases**:

- **Aquatic Acute 1**: Hazardous to the aquatic environment - Acute Hazard Category 1
- **Aquatic Chronic 3**: Hazardous to the aquatic environment - Chronic Hazard Category 3
- **Carc. 2**: Carcinogenicity Category 2
- **Comb. Dust**: Combustible Dust
- **Flam. Sol. 1**: Flammable solids Category 1
- **Self-heat. 1**: Self-heating substances and mixtures Category 1
- **Skin Sens. 1**: Skin sensitization Category 1
- **STOT RE 1**: Specific target organ toxicity (repeated exposure) Category 1
- **Water-react. 2**: Substances and mixtures which in contact with water emit flammable gases Category 2
- **H228**: Flammable solid

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<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>H251</td>
<td>May form combustible dust concentrations in air</td>
</tr>
<tr>
<td>H261</td>
<td>Self-heating: may catch fire</td>
</tr>
<tr>
<td>H317</td>
<td>In contact with water releases flammable gases</td>
</tr>
<tr>
<td>H351</td>
<td>May cause an allergic skin reaction</td>
</tr>
<tr>
<td>H372</td>
<td>Suspected of causing cancer</td>
</tr>
<tr>
<td>H400</td>
<td>Causes damage to organs through prolonged or repeated exposure</td>
</tr>
<tr>
<td>H412</td>
<td>Very toxic to aquatic life</td>
</tr>
<tr>
<td></td>
<td>Causes damage to organs through prolonged or repeated exposure</td>
</tr>
<tr>
<td></td>
<td>Harmful to aquatic life with long lasting effects</td>
</tr>
</tbody>
</table>

*This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.*

SDS US (GHS HazCom) - US Only 10 pt 2