MATERIAL SAFETY DATA SHEET

PRODUCT NAME: By Grade(s) WOOLWIRE

Section I
Manufacturer's Name - Northwestern Steel and Wire Company
121 Wallace Street
Sterling, IL. 61081
Emergency Telephone Number
815-625-2500

Prepared By:
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Industrial Hygienist/ Safety Eng.

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Section II - Hazardous Ingredients/ Identity Information

<table>
<thead>
<tr>
<th>Hazardous components</th>
<th>OSHA PEL</th>
<th>ACGIH TLV</th>
<th>RANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iron (iron oxide fume)</td>
<td>10mg/m3</td>
<td>5mg/m3</td>
<td>96-98%</td>
</tr>
<tr>
<td>Carbon</td>
<td>None listed</td>
<td>None listed</td>
<td>.07-.13%</td>
</tr>
<tr>
<td>Manganese (dust)</td>
<td>5mg/m3</td>
<td>5mg/m3</td>
<td>.65-.90%</td>
</tr>
<tr>
<td>Silicon</td>
<td>None listed</td>
<td>None listed</td>
<td>.08-.12%</td>
</tr>
<tr>
<td>Nickel</td>
<td>1mg/m3</td>
<td>1mg/m3</td>
<td>.00-.10%</td>
</tr>
<tr>
<td>Chromium</td>
<td>.5mg/m3</td>
<td>1mg/m3</td>
<td>.00-.12%</td>
</tr>
<tr>
<td>Phosphorus</td>
<td>.01mg/m3</td>
<td>.01mg/m3</td>
<td>.055-.08%</td>
</tr>
<tr>
<td>Sulfur</td>
<td>5mg/m3</td>
<td>10mg/m3</td>
<td>.00-.035%</td>
</tr>
<tr>
<td>Copper</td>
<td>.01mg/m3</td>
<td>.02mg/m3</td>
<td>.00-.16%</td>
</tr>
<tr>
<td>Boron</td>
<td>15mg/m3</td>
<td>10mg/m3</td>
<td>.00-.0006%</td>
</tr>
<tr>
<td>Niobium</td>
<td>None listed</td>
<td>None listed</td>
<td>.00-.012%</td>
</tr>
<tr>
<td>Vanadium</td>
<td>.10mg/m3</td>
<td>.05mg/m3</td>
<td>.00-.01%</td>
</tr>
<tr>
<td>Molybdenum</td>
<td>5mg/m3</td>
<td>5mg/m3</td>
<td>.00-.02%</td>
</tr>
</tbody>
</table>

NOTE: All commercial metals contain small amounts of various elements in addition to those specified. These small quantities, frequently are referred to as "trace" "residual" elements, generally originate in the raw materials used.

SARA 313:
Some of the above components may be subject to Sara 313 reporting requirements. Please also note that if you prepackage or otherwise redistribute this product to industrial customers, Sara 313 requires that a notice be sent to those customers.
Section III - Physical/Chemical Characteristics
MELTING POINT: 2750-degrees       METALLIC COATING: N/A

APPEARANCE AND ODOR: Metallic gray, with no odor.

Section IV - Fire and Explosion Hazard Data
STEEL PRODUCTS IN THE SOLID STATE PRESENT NO FIRE OR EXPLOSION HAZARD.

Section V - Reactivity Data
Stable under normal conditions of use, storage and transport. Will react with strong acid to liberate hydrogen. At temperatures above the melting point, may liberate fumes containing oxides of iron and alloying elements.

Section VI - Health Hazard Data
Route(s) of entry  Inhalation? Skin? Ingestion?
Yes      No      No

EFFECTS OF OVEREXPOSURE:
NOTE: Steel products under normal conditions do not present an inhalation, or ingestion health hazard. However, operations, such as, burning, welding, sawing, brazing, grinding, and possibly machining, etc. which results in elevating the temperature of the product to or above its melting point may result in the generation of airborne particulates, and may present a health hazard.

SYMPTOMS: ACUTE: Inhalation of high concentrations of iron oxide fumes or dusts may lead to a benign pneumoconiosis (siderosis). Inhalation of high concentrations of ferric oxide may possibly enhance the risk of lung cancer development in workers exposed to pulmonary carcinogens. The inhalations of high concentrations of freshly formed oxide fumes and dusts of Manganese, Copper, Lead and/or Zinc in the respirable particle size range can cause an influenza like illness termed metal fume fever. Typical symptoms last 12 to 48 hours and are characterized by metallic taste in the mouth, dryness and irritation of the throat, followed by weakness, muscle pain, fever and chills.

CHRONIC: Excessive and repeated overexposure of nickel and chromium can cause various forms of dermatitis, inflammation and/or ulceration of the upper respiratory tract. Both chromium and nickel have been associated with upper respiratory cancer. Excessive and prolonged inhalation of manganese fumes can cause bronchitis, pneumonitis, lack of coordination.
EMERGENCY FIRST AID: For overexposure to airborne fumes and particulates, remove exposed person to fresh air. If breathing is difficult or has stopped, administer artificial respiration as indicated. Seek medical attention promptly. Treat metal fume fever by bed rest, and administer pain and fever reducing medication.

*******Section VII. - Spill or Leak Procedures*******

Not applicable to steel in the solid state.

*******Section VIII. - Special Protection Information*******

RESPIRATORY - NIOSH/MSHA -approved dust and fume respirators should be used to avoid excessive inhalation of particulates. Appropriate respirator selection depends on the magnitude of the exposure.

PROTECTIVE GLOVES - Recommended for protection from abrasions and lacerations.

EYE PROTECTION - Recommended when welding, burning, sawing, brazing, grinding, or machining to prevent excessive dust exposure to eyes.

OTHER PROTECTIVE EQUIPMENT - Additional protective equipment may be required depending on your application, and generation of airborne particulates.

*******Section IX. - Special Precautions*******

Extra precaution should be taken in handling and storage-operations when the potential for generating high concentrations of airborne particulates is anticipated. Evaluate and control as necessary. Avoid breathing metal fumes and/or dusts.