MATERIAL SAFETY DATA SHEET

1 PRODUCT AND COMPANY IDENTIFICATION

Product Name: Prepainted Steel Sheet Coil - Galvanized

Manufacturer Name: Steel Dynamics, Inc.
Flat Roll Division
4500 County Road 59
Butler, IN 46721
Telephone: (260)-868-8000

Manufacturer Name: Steel Dynamics, Inc.
Flat Roll Division
4500 County Road 59
Butler, IN 46721
Telephone: (260)-868-8000

Emergency Telephone: (800)-424-9300

Intended Use: Steel Fabricated Parts

Contact Person: Safety Department

2 HAZARDS IDENTIFICATION

Emergency Overview
Physical State: Solid
Color: Various colors
Odor: None

In its manufactured and shipped state, this product is considered non-hazardous. Processing may generate hazardous fumes and dusts.

Potential Health Effects

Inhalation: No inhalation hazard under normal conditions. Welding, burning, sawing, brazing, grinding or machining operations may generate fumes and dusts of metal oxides. High concentrations of freshly formed fumes/dusts of metal oxides can produce symptoms of metal fume fever.

Eye Contact: Under normal conditions of intended use, this material does not pose a risk to health. Contact with hot material can cause thermal burns which may result in permanent damage. Grinding and sanding this product may generate dust. Dust may irritate the eyes. Exposed individuals may experience eye tearing, redness, and discomfort.

Skin Contact: Under normal conditions of intended use, this material does not pose a risk to health. Dust may irritate skin. May dry the skin leading to discomfort and dermatitis. Skin contact may aggravate an existing dermatitis. Contact with hot material can cause thermal burns which may result in permanent damage.

Ingestion: Solid steel: Not relevant, due to the form of the product. However, ingestion of dusts generated during working operations may cause nausea and vomiting.

Chronic Health Effects: Frequent inhalation of fume/dust over a long period of time increases the risk of developing lung diseases. Contains nickel. May cause sensitization by skin contact. Nickel is listed by IARC (Group 2B) and NTP. Vanadium pentoxide is classified as possibly carcinogenic to
humans (Group 2B) by IARC, may cause adverse reproductive effects and may adversely affect the
developing fetus. A residual chrome VI compound from the surface coating is water soluble and is
carcinogenic. Chromium VI compounds are regarded as human carcinogens by IARC, NTP, OSHA and
ACGIH. Exposure to manganese fume/dust can affect the central nervous system (apathy, drowsiness,
weakness and other chronic symptoms such as postural tremors). These ingredients are bound within
the product and release is not expected under normal conditions.

**Target Organ(s):**  |  Skin  |  Lung  |  Central nervous system  |

**Potential Physical / Chemical Effects:**  The dangerous properties of the product are considered limited.

**OSHA Regulatory Status:** Under some use conditions, this material may be considered to be
hazardous in accordance with OSHA 29 CFR 1910.1200.

**Environment:**  The environmental hazard of the product is considered to be limited.

### 3. COMPOSITION / INFORMATION ON INGREDIENTS

**General Information:** The product is an alloy. May liberate hazardous oxides such as iron oxides
and vanadium pentoxide at temperatures above the melting point. The substrate is galvanized with zinc.
The zinc surface may be treated with chromic acid leaving a residual coating of chrome III and VI
compounds. The treated alloy surface is coated. Coatings may include vinyl, epoxy, polyester,
siliconized polyester, acrylic, fluorocarbons, polyurethane, petrolatum, chromium conversion and
titanium conversion.

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS-No.</th>
<th>Concentration*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iron</td>
<td>7439-89-6</td>
<td>90 - 100%</td>
</tr>
<tr>
<td>†Coating(s)</td>
<td>-</td>
<td>&lt; 3%</td>
</tr>
<tr>
<td>†Manganese</td>
<td>7439-96-5</td>
<td>0 - 2%</td>
</tr>
<tr>
<td>†Chromium</td>
<td>7440-47-3</td>
<td>0 - 1%</td>
</tr>
<tr>
<td>†Iron oxide**</td>
<td>1309-37-1</td>
<td>0%</td>
</tr>
<tr>
<td>†Silicon</td>
<td>7440-21-3</td>
<td>0 - 1%</td>
</tr>
<tr>
<td>†Vanadium pentoxide**</td>
<td>1314-62-1</td>
<td>0%</td>
</tr>
<tr>
<td>†Zinc oxide**</td>
<td>1314-13-2</td>
<td>0%</td>
</tr>
<tr>
<td>†Nickel</td>
<td>7440-02-0</td>
<td>0 - 0.4%</td>
</tr>
<tr>
<td>Vanadium</td>
<td>7440-62-2</td>
<td>0 - 0.2%</td>
</tr>
</tbody>
</table>

* All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.
† This chemical is hazardous according to OSHA/WHMIS criteria.
**Iron oxide and vanadium pentoxide are formed at temperatures above the melting point. **Zinc oxide fumes may be formed
during burning, cutting, or welding.

### 4. FIRST AID MEASURES

**Inhalation:** In case of inhalation of dusts or fumes from heated product: Move into fresh air and keep
at rest. Get medical attention if symptoms persist. If breathing is difficult, give oxygen. If breathing
stops, provide artificial respiration.

**Eye Contact:** Any material that contacts the eye should be washed out immediately with water. If easy
to do, remove contact lenses. Get medical attention promptly if symptoms occur after washing.

**Skin Contact:** Wash skin with soap and water. In case of burns with hot metal, rinse with plenty of
cold water. If burns are severe, consult a physician. If skin irritation or an allergic skin reaction develops, get medical attention.

**Ingestion:** Solid steel: Not Applicable  Dust: Get medical attention if any discomfort continues.

## 5 FIRE-FIGHTING MEASURES

**Extinguishing Media:** Use fire-extinguishing media appropriate for surrounding materials.

**Unsuitable Extinguishing Media:** Not applicable.

**Special Fire Fighting Procedures:** Use standard firefighting procedures and consider the hazards of other involved materials.

**Unusual Fire & Explosion Hazards:** No unusual fire or explosion hazards noted.

**Hazardous Combustion Products:** Acrid fumes, Carbon Dioxide, Carbon Monoxide, Nitrogen Oxides, Sulfur Oxides, inorganic compounds

**Protective Measures:** Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

**Flammability Class:** NFPA Rating Fire = 0. Materials that will not burn.

## 6 ACCIDENTAL RELEASE MEASURES

**Personal Precautions:** Cold solid metal: No special precautions are necessary beyond normal good hygiene practices. See Section 8 of the MSDS for additional personal protection advice when handling this product. Hot metal: Avoid contact with hot material. Wear protective clothing as described in Section 8 of this safety data sheet.

**Spill Cleanup Methods:** Collect for recycling.

**Environmental Precautions:** No specific precautions.

**Notification Procedures:** In the event of accidental release, notify relevant authorities in accordance with all applicable regulations.

## 7 HANDLING AND STORAGE

**Handling:** Avoid contact with sharp edges and hot surfaces. Use appropriate gloves and tools to ensure safe handling. Use work methods which minimize dust/fume production. Do not breathe fumes and dusts. Observe safety measures suited to the coating(s) when handling, cutting or melting. Follow the recommendations in ANSI Z49.1, Safety in welding and cutting (ANSI=American National Standard Institute).

**Storage:** Store in a dry place. Store away from: Acids. Oxidizing agents.

## 8 EXPOSURE CONTROLS / PERSONAL PROTECTION
Exposure Limits:

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Source</th>
<th>Type</th>
<th>Exposure Limits</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chromium</td>
<td>NIOSH Guide</td>
<td>IDLH</td>
<td>250 mg/m³</td>
<td></td>
</tr>
<tr>
<td>Chromium</td>
<td>US. OSHA</td>
<td>TWA</td>
<td>1 mg/m³</td>
<td>as Cr</td>
</tr>
<tr>
<td>Iron oxide** (Respirable fraction.)</td>
<td>ACGIH</td>
<td>TWA</td>
<td>5 mg/m³</td>
<td>as Fe</td>
</tr>
<tr>
<td>Iron oxide**</td>
<td>NIOSH Guide</td>
<td>IDLH</td>
<td>2500 mg/m³</td>
<td>as Fe</td>
</tr>
<tr>
<td>Iron oxide** (Fume.)</td>
<td>US. OSHA</td>
<td>TWA</td>
<td>10 mg/m³</td>
<td></td>
</tr>
<tr>
<td>Manganese</td>
<td>ACGIH</td>
<td>TWA</td>
<td>0.2 mg/m³</td>
<td>as Mn</td>
</tr>
<tr>
<td>Manganese</td>
<td>NIOSH Guide</td>
<td>IDLH</td>
<td>500 mg/m³</td>
<td>as Mn</td>
</tr>
<tr>
<td>Manganese (Fume.)</td>
<td>US. OSHA</td>
<td>Ceiling</td>
<td>5 mg/m³</td>
<td>as Mn</td>
</tr>
<tr>
<td>Nickel (Inhalable fraction.)</td>
<td>ACGIH</td>
<td>TWA</td>
<td>1.5 mg/m³</td>
<td>as Ni</td>
</tr>
<tr>
<td>Nickel</td>
<td>NIOSH Guide</td>
<td>IDLH</td>
<td>10 mg/m³</td>
<td>as Ni</td>
</tr>
<tr>
<td>Nickel</td>
<td>US. OSHA</td>
<td>TWA</td>
<td>1 mg/m³</td>
<td>as Ni</td>
</tr>
<tr>
<td>Silicon</td>
<td>ACGIH</td>
<td>TWA</td>
<td>10 mg/m³</td>
<td></td>
</tr>
<tr>
<td>Silicon (Respirable fraction.)</td>
<td>US. OSHA</td>
<td>TWA</td>
<td>5 mg/m³</td>
<td></td>
</tr>
<tr>
<td>Silicon (Total dust.)</td>
<td>US. OSHA</td>
<td>TWA</td>
<td>15 mg/m³</td>
<td></td>
</tr>
<tr>
<td>Vanadium pentoxide** (Respirable fraction.)</td>
<td>ACGIH</td>
<td>TWA</td>
<td>0.05 mg/m³</td>
<td>as V2O5</td>
</tr>
<tr>
<td>Vanadium pentoxide**</td>
<td>NIOSH Guide</td>
<td>IDLH</td>
<td>35 mg/m³</td>
<td>as V2O5</td>
</tr>
<tr>
<td>Vanadium pentoxide** (Fume.)</td>
<td>US. OSHA</td>
<td>Ceiling</td>
<td>0.1 mg/m³</td>
<td>as V2O5</td>
</tr>
<tr>
<td>Zinc oxide** (Respirable fraction.)</td>
<td>ACGIH</td>
<td>TWA</td>
<td>2 mg/m³</td>
<td></td>
</tr>
<tr>
<td>Zinc oxide** (Respirable fraction.)</td>
<td>ACGIH</td>
<td>STEL</td>
<td>10 mg/m³</td>
<td></td>
</tr>
<tr>
<td>Zinc oxide**</td>
<td>NIOSH Guide</td>
<td>IDLH</td>
<td>500 mg/m³</td>
<td></td>
</tr>
<tr>
<td>Zinc oxide** (Fume.)</td>
<td>US. OSHA</td>
<td>TWA</td>
<td>5 mg/m³</td>
<td></td>
</tr>
<tr>
<td>Zinc oxide** (Respirable fraction.)</td>
<td>US. OSHA</td>
<td>TWA</td>
<td>5 mg/m³</td>
<td></td>
</tr>
</tbody>
</table>

Consult Canadian Provincial Regulations and/or Mexican Regulations on exposure limits, if applicable.

**Iron oxide and vanadium pentoxide are formed at temperatures above the melting point.  **Zinc oxide fumes may be formed during burning, cutting, or welding.

Engineering Controls: Adequate ventilation should be provided so that exposure limits are not exceeded. Use local exhaust when welding, burning, sawing, brazing, grinding or machining to prevent excessive dust or fume exposure.

Respiratory Protection: Use a NIOSH/MSHA approved respirator if there is a risk of exposure to dust/fume at levels exceeding the exposure limits.

Eye Protection: Use of safety glasses or goggles is required for welding, burning, sawing, brazing, grinding or machining operations. In addition to safety glasses or goggles, a welding helmet with appropriate shaded shield is required during welding, burning, or brazing. A face shield is recommended, in addition to safety glasses or goggles, during sawing, grinding, or machining.
**Hand Protection:** Wear protective gloves. When material is heated, wear gloves to protect against thermal burns. While handling product and/or steel packing material wear cut resistant gloves and sleeves for laceration protection.

**Skin Protection:** Wear suitable protective clothing. Thermally protective apron or coat with long sleeves are recommended when the volume of hot material is significant.

**Hygiene Measures:** 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. Observe any medical surveillance requirements.

**Environmental Exposure Controls:** Environmental manager must be informed of all major releases.

### 9 PHYSICAL AND CHEMICAL PROPERTIES

- **Color:** Various colors
- **Odor:** None
- **Odor Threshold:** Not applicable.
- **Physical State:** Solid
- **pH:** Not applicable
- **Melting Point:** 1510°C (2750°F)
- **Freezing Point:** Not applicable.
- **Boiling Point:** Not applicable.
- **Flash Point:** Not applicable.
- **Evaporation Rate:** Not applicable.
- **Flammability Limit - Upper (%):** Not applicable.
- **Flammability Limit - Lower (%):** Not applicable.
- **Vapor Pressure:** Not applicable.
- **Vapor Density (Air=1):** Not applicable.
- **Specific Gravity:** No data available.
- **Solubility in Water:** Insoluble
- **Solubility (Other):** No data available.
- **Partition Coefficient (n-Octanol/water):** Not applicable.
- **Autoignition Temperature:** Not applicable.
- **Decomposition Temperature:** No data available.

### 10 STABILITY AND REACTIVITY

**Stability:** This product is stable under expected conditions of use.

**Conditions to Avoid:** Avoid contact with acids and oxidizing substances.

**Incompatible Materials:** Strong Acids. Oxidizing agents.

**Hazardous Decomposition Products:**

<table>
<thead>
<tr>
<th>At Elevated Temperatures:</th>
<th>Acrid fumes, Carbon Dioxide, Carbon Monoxide, Halogens, Metal oxides, Nitrogen Oxides, Sulfur Oxides</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strong Acid Contact:</td>
<td>Hydrogen, inorganic compounds</td>
</tr>
</tbody>
</table>

**Possibility of Hazardous Reactions:** Will not occur.
11 TOXICOLOGICAL INFORMATION

Specified Substance(s)

Acute Toxicity:

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Test Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manganese</td>
<td>Oral LD50 (Rat): 9 g/kg</td>
</tr>
<tr>
<td>Silicon</td>
<td>Oral LD50 (Rat): 3160 mg/kg</td>
</tr>
</tbody>
</table>

Other Acute: High concentrations of freshly-formed fumes of zinc oxide can produce symptoms of metal fume fever.

Chronic Toxicity: Contains nickel. May cause sensitization by skin contact. Nickel is listed by IARC (Group 2B) and NTP. Vanadium pentoxide is classified as possibly carcinogenic to humans (Group 2B) by IARC, may cause adverse reproductive effects and may adversely affect the developing fetus. A residual chrome VI compound from the surface coating is water soluble and is carcinogenic. Chromium VI compounds are regarded as human carcinogens by IARC, NTP, OSHA and ACGIH. Exposure to manganese fume/dust can affect the central nervous system (apathy, drowsiness, weakness and other chronic symptoms such as postural tremors).

Listed Carcinogens:

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>IARC</th>
<th>NTP</th>
<th>OSHA</th>
<th>ACGIH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chromium</td>
<td>3</td>
<td>Not Listed</td>
<td>Not Listed</td>
<td>A4</td>
</tr>
<tr>
<td>Iron oxide**</td>
<td>3</td>
<td>Not Listed</td>
<td>Not Listed</td>
<td>A4</td>
</tr>
<tr>
<td>Nickel**</td>
<td>2B</td>
<td>Listed</td>
<td>Not Listed</td>
<td>A5</td>
</tr>
<tr>
<td>Vanadium pentoxide**</td>
<td>2B</td>
<td>Not Listed</td>
<td>Not Listed</td>
<td>A4</td>
</tr>
</tbody>
</table>

IARC: 1 = Carcinogenic to Humans; 2A = Probably Carcinogenic to Humans; 2B = Possibly Carcinogenic to Humans; 3 = Not classifiable as to carcinogenicity to humans; 4 = Probably not carcinogenic to humans; Not listed = Not evaluated by IARC.

ACGIH: A1 = Confirmed Human Carcinogen; A2 = Suspected Human Carcinogen; A3 = Confirmed Animal Carcinogen; A4 = Not classifiable as a human carcinogen; A5 = Not suspected to be a human carcinogen; Not listed = Not evaluated by ACGIH.

Product Information

Acute Toxicity: High concentrations of freshly formed fumes/dusts of metal oxides can produce symptoms of metal fume fever. Inhalation of dust (generated at high temperatures only) may cause mild irritation of the upper respiratory tract. Prolonged contact may cause redness, irritation and cracking. Welding, cutting and metalizing can generate ozone. Ozone can cause irritation of eyes, nose and respiratory tract.

Chronic Toxicity: Frequent inhalation of fume/dust over a long period of time increases the risk of developing lung diseases. The product contains a small amount of sensitizing substance which may provoke an allergic reaction among sensitive individuals in contact with skin. The ingredients of the alloy are bound within the product and release is not expected under normal conditions.

12 ECOLOGICAL INFORMATION

Ecotoxicity: No data available.

Mobility: Not relevant, due to the form of the product.
Persistence and Degradability: No data available.

Bioaccumulation Potential: No data available on bioaccumulation.

Other Adverse Effects: None known.

### DISPOSAL CONSIDERATIONS

**General Information:** Dispose waste and residues in accordance with applicable federal, state, and local regulations.

**Disposal Methods:** Disposal recommendations are based on material as supplied. Disposal must be in accordance with current applicable laws and regulations, and material characteristics at time of disposal. Recover and reclaim or recycle, if practical.

**Container:** Since emptied containers retain product residue, follow label warnings even after container is emptied.

### TRANSPORT INFORMATION

**DOT** Not regulated.

**TDG** Not regulated.

**IATA** Not regulated.

**IMDG** Not regulated.

### REGULATORY INFORMATION

**Canadian Controlled Products Regulations:** This product has been classified according to the hazard criteria of the Canadian Controlled Products Regulations, Section 33, and the MSDS contains all required information.

**WHMIS Classification:** D2A

**Mexican Dangerous Statement:** Under some use conditions, this material may be considered to be hazardous in accordance with Mexican regulations.

**Inventory Status**

This product or all components are listed on the following inventory: DSL, TSCA

**US Regulations**

**CERCLA Hazardous Substance List (40 CFR 302.4):** For metals, the stated Reportable Quantity (RQ) applies to particles smaller than 100 micrometers.

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>RQ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vanadium pentoxide**</td>
<td>1000 lbs</td>
</tr>
</tbody>
</table>
Zinc oxide** - No reportable quantity.
Chromium 5000 lbs
Manganese - 100 lbs
Nickel - No reportable quantity.

** SARA Title III **

Section 302 Extremely Hazardous Substances (40 CFR 355, Appendix A):

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>RQ</th>
<th>TPQ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vanadium pentoxide**</td>
<td></td>
<td>1000 lbs</td>
</tr>
</tbody>
</table>

** Section 311/312 (40 CFR 370): **

- Acute (Immediate)   ☑ Chronic (Delayed)   Fire   Reactive   Pressure Generating

** Section 313 Toxic Release Inventory (40 CFR 372): **

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS-No.</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zinc oxide**</td>
<td>1314-13-2</td>
<td>0%</td>
</tr>
<tr>
<td>Chromium</td>
<td>7440-47-3</td>
<td>0 - 1%</td>
</tr>
<tr>
<td>Nickel</td>
<td>7440-02-0</td>
<td>0 - 0.4%</td>
</tr>
<tr>
<td>Vanadium pentoxide**</td>
<td>1314-62-1</td>
<td>0%</td>
</tr>
<tr>
<td>Manganese</td>
<td>7439-96-5</td>
<td>0 - 2%</td>
</tr>
</tbody>
</table>

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

** Clean Water Act Section 311 Hazardous Substances (40 CFR 117.3): **
Vanadium pentoxide**

** Drug Enforcement Act: **

** TSCA: **

- TSCA Section 4(a) Final Test Rules & Testing Consent Orders: Not regulated.
- TSCA Section 5(e) PMN-Substance Consent Orders: Not regulated.

** State Regulations **

- California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65): Nickel; Vanadium pentoxide**
- Massachusetts Right-To-Know List: Chromium; Iron oxide**; Manganese; Nickel; Vanadium pentoxide**; Zinc oxide**
Minnesota Hazardous Substances List: Chromium; Iron oxide**; Manganese; Nickel; Vanadium pentoxide**; Zinc oxide**

New Jersey Right-To-Know List: Chromium; Iron oxide**; Manganese; Nickel; Vanadium pentoxide**; Zinc oxide**

Pennsylvania Right-To-Know List: Chromium; Iron oxide**; Manganese; Nickel; Vanadium pentoxide**; Zinc oxide**

Rhode Island Right-To-Know List: Chromium; Iron oxide**; Manganese; Nickel; Vanadium pentoxide**; Zinc oxide**

16 OTHER INFORMATION

HAZARD RATINGS

<table>
<thead>
<tr>
<th>NFPA</th>
<th>Health Hazard</th>
<th>Fire Hazard</th>
<th>Instability</th>
<th>Special Hazard</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Hazard rating: 0 - Minimal; 1 - Slight; 2 - Moderate; 3 - Serious; 4 - Severe
NFPA Label colored diamond code: Blue - Health; Red - Flammability; Yellow - Instability; White - Special Hazards

<table>
<thead>
<tr>
<th>HMIS</th>
<th>Health Hazard</th>
<th>Flammability</th>
<th>Physical Hazard</th>
<th>Personal Protection</th>
</tr>
</thead>
<tbody>
<tr>
<td>2*</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>X</td>
</tr>
</tbody>
</table>

Hazard rating: 0 - Minimal; 1 - Slight; 2 - Moderate; 3 - Serious; 4 - Severe
* - Chronic Health Effect
Personal Protection codes: X - Specialized Handling
HMIS Label colored bar code: Blue - Health; Red - Flammability; Orange - Physical Hazards; White - Special

This MSDS contains revisions in the following section(s): 15, 16.

Issue Date: 13-Sep-2007
Supercedes Date: 07-May-2007
SDS No.: 1005641

Disclaimer: This information is provided without warranty. The information is believed to be correct. This information should be used to make an independent determination of the methods to safeguard workers and the environment. MSDS’s for specific coatings are available upon request.