



# USS-POSCO Industries

## Material Safety Data Sheet

Original Issue Date: 02/10/04

Revised: 05/11/10

### Section 1 - Chemical Product and Company Identification

**Product/Chemical Name:** Galvanized (Hot Dipped) Sheet – Carbon Steel;  
Galvannealed (Hot Dipped) Sheet – Carbon Steel;  
UPI.GalXC Sheet – Carbon Steel

**Also Includes:** Culvert

**Manufacturer:** USS-POSCO Industries, 900 Loveridge Rd., Pittsburg, California 94565

**General Information:** (925) 439-6000 (8:00 am to 5:00 pm); FAX: (925) 439-6722

**Off-Hour Emergency Phone Number:** (925) 439-6180

### Section 2 - Composition / Information on Ingredients

| Ingredient Name           | CAS Number | Percentage by wt. | OSHA PEL <sup>1</sup>  | ACGIH TLV <sup>2</sup>  |
|---------------------------|------------|-------------------|--|---|
| <b>Base Metal</b>         |            |                   |  |   |
| Iron                      | 7439-89-6  | >90.0             | 10 mg/m <sup>3</sup> - Iron oxide fume   | 5 mg/m <sup>3</sup> - Iron oxide dust and fume  |
| <b>Alloying Elements</b>  |            |                   |  |   |
| Calcium                   | 7440-70-2  | 0.10 max.         | 5 mg/m <sup>3</sup> - Calcium oxide  | 2 mg/m <sup>3</sup> - Calcium oxide   |
| Carbon                    | 7440-44-0  | 0.60 max.         | 15 mg/m <sup>3</sup> - Total dust (PNOR) <sup>3</sup><br>5 mg/m <sup>3</sup> - Respirable fraction (PNOR)    | 10 mg/m <sup>3</sup> - Inhalable fraction <sup>4</sup> (PNOS) <sup>5</sup><br>3 mg/m <sup>3</sup> - Respirable fraction <sup>6</sup> (PNOS) |
| Copper                    | 7440-50-8  | 0.50 max.         | 0.1 mg/m <sup>3</sup> - Fume (as Cu)<br>1 mg/m <sup>3</sup> - Dusts & mists (as Cu)                          | 0.2 mg/m <sup>3</sup> - Fume<br>1 mg/m <sup>3</sup> - Dusts & mists (as Cu)   |
| Manganese                 | 7439-96-5  | 0.90 max.         | 5 mg/m <sup>3</sup> (C) - Fume & Mn compounds  | 0.2 mg/m <sup>3</sup>   |
| Phosphorus                | 8049-19-2  | 0.15 max.         | 15 mg/m <sup>3</sup> - Total dust (PNOR)<br>5 mg/m <sup>3</sup> - Respirable fraction (PNOR)                 | 10 mg/m <sup>3</sup> - Inhalable fraction (PNOS)<br>3 mg/m <sup>3</sup> - Respirable fraction (PNOS)  |
| Silicon                   | 7440-21-3  | 0.60 max.         | 15 mg/m <sup>3</sup> - Total dust<br>5 mg/m <sup>3</sup> - Respirable fraction                               | 10 mg/m <sup>3</sup>  |
| Sulfur                    | 7704-34-9  | 0.04 max.         | 15 mg/m <sup>3</sup> - Total dust (PNOR)<br>5 mg/m <sup>3</sup> - Respirable fraction (PNOR)                 | 10 mg/m <sup>3</sup> - Inhalable fraction (PNOS)<br>3 mg/m <sup>3</sup> - Respirable fraction (PNOS)  |
| <b>Metallic Coating</b> * |            |                   |  |   |
| Aluminum                  | 7429-90-5  | 0.055 max.        | 15 mg/m <sup>3</sup> - Total dust<br>5 mg/m <sup>3</sup> - Respirable fraction                               | 10 mg/m <sup>3</sup> - Metal Dust<br>5 mg/m <sup>3</sup> - Welding fume   |
| Antimony                  | 7440-36-0  | 0.011 max.        | 0.5 mg/m <sup>3</sup>  | 0.5 mg/m <sup>3</sup>   |
| Iron                      | 7439-89-6  | 0.8 max.          | 10 mg/m <sup>3</sup> - Iron oxide fume   | 5 mg/m <sup>3</sup> - Iron oxide dust and fume  |
| Lead                      | 7439-92-1  | 0.004 max.        | 0.05 mg/m <sup>3</sup> <sup>7</sup>  | 0.05 mg/m <sup>3</sup>  |
| Zinc                      | 7440-66-6  | 0.15-9.1          | 5 mg/m <sup>3</sup> - Fume<br>15 mg/m <sup>3</sup> - Total dust<br>5 mg/m <sup>3</sup> - Respirable fraction | 5 mg/m <sup>3</sup> - Fume<br>10 mg/m <sup>3</sup> - Fume (STEL)<br>10 mg/m <sup>3</sup> - Dust   |

**Notes:**

- \* Percent weight of metallic coating is a percent of the total product.
- Galvanized sheet surfaces may be chemically treated, generally at the customer's specification, with trace amounts of chromate solution (approximately 1 to 2 mg/ft<sup>2</sup> per side or <0.002% of total product weight) to prevent humid storage stain, and/or phosphate solution (<300 mg/ft<sup>2</sup> or <0.3%) to enhance paint adherence and formability. Surface may also be treated with small amounts (<0.05%) of corrosion-inhibiting oil.

- All commercial steel products may contain small amounts of various elements in addition to those specified. These small quantities (less than 0.1%) may exist as intentional additions, or as “trace” or “residual” elements that generally originate in the raw materials used. These elements may include: aluminum, antimony, arsenic, boron, cadmium, calcium, chromium, cobalt, columbium, copper, lead, molybdenum, nickel, silicon, tin, titanium, vanadium, and zirconium.
- <sup>1</sup> OSHA Permissible Exposure Limits (PELs) are 8-hour TWA (time-weighted average) concentrations unless otherwise noted. A (“C”) designation denotes a ceiling limit, which should not be exceeded during any part of the working exposure unless otherwise noted. A Short Term Exposure Limit (STEL) is defined as a 15-minute exposure, which should not be exceeded at any time during a workday.
- <sup>2</sup> Threshold Limit Values (TLV) established by the American Conference of Governmental Industrial Hygienists (ACGIH) are 8-hour TWA concentrations unless otherwise noted.
- <sup>3</sup> PNOR (Particulates Not Otherwise Regulated). All inert or nuisance dusts, whether mineral, inorganic, or organic, not listed specifically by substance name are covered by the PNOR limit which is the same as the inert or nuisance dust limit of 15 mg/m<sup>3</sup> for total dust and 5 mg/m<sup>3</sup> for the respirable fraction.
- <sup>4</sup> Inhalable fraction. The concentration of inhalable particulate for the application of this TLV is to be determined from the fraction passing a size-selector with the characteristics defined in the ACGIH TLVs and BEIs Appendix D, paragraph A.
- <sup>5</sup> PNOS (Particulates Not Otherwise Specified). Particulates identified under the PNOS heading are “nuisance dusts” containing no asbestos and <1% crystalline silica. A TWA-TLV of 10 mg/m<sup>3</sup> for inhalable particulate and 3 mg/m<sup>3</sup> for respirable particulate has been recommended.
- <sup>6</sup> Respirable fraction. The concentration of respirable dust for the application of this limit is to be determined from the fraction passing a size-selector with the characteristics defined in the ACGIH TLVs and BEIs Appendix D, paragraph C.
- <sup>7</sup> The 8-hour PEL is 50 ug/m<sup>3</sup>. If an employee is exposed to lead for more than 8 hours in any work day, the PEL, as a TWA for that day, shall be reduced according to the following formula: Maximum permissible limit (in ug/m<sup>3</sup>) = 400 divided by hours worked in that day. The Action Level is 30 ug/m<sup>3</sup> averaged over an 8-hour period.

### Section 3 - Hazards Identification

#### ☆☆☆☆☆ Emergency Overview ☆☆☆☆☆

This formed solid metal product poses little or no immediate health or fire hazard. When product is subjected to welding, burning, melting, sawing, brazing, grinding, or other similar processes, potentially hazardous airborne particulate and fumes may be generated. Avoid inhalation of metal dusts and fumes. Operations having the potential to generate airborne particulates should be performed in well ventilated areas and, if appropriate, respiratory protection and other personal protective equipment should be used. Iron or steel foreign bodies imbedded in the cornea of the eye may produce rust stains unless removed fairly promptly.

#### Potential Health Effects

**Primary Entry Routes:** Inhalation and skin, if coated. Steel products in the natural state do not present an inhalation, ingestion or contact hazard. However, operations such as burning, welding, sawing, brazing, machining and grinding may result in the following effects if exposures exceed recommended limits as listed in Section 2.

**Target Organs:** Respiratory system.

**Acute Effects:**

- **Inhalation:** Excessive exposure to high concentrations of dust may cause irritation to the eyes, skin and mucous membranes of the upper respiratory tract. Excessive inhalation of fumes of freshly formed metal oxide particles sized below 1.5 microns and usually between 0.02-0.05 microns from many metals can produce an acute reaction known as “metal fume fever”. Symptoms consist of chills and fever (very similar to and easily confused with flu symptoms), metallic taste in the mouth, dryness and irritation of the throat followed by weakness and muscle pain. The symptoms come on in a few hours after excessive exposures and usually last from 12 to 48 hours. Long-term effects from metal fume fever have not been noted. Freshly formed oxide fumes of manganese, copper and zinc have been associated with causing metal fume fever. Although not expected to cause effects based upon the quantity present in the material, inhalation or ingestion of lead particles may result in lead-induced systemic toxicity. Symptoms of lead poisoning include abdominal cramps, anemia, muscle weakness and headache.
- **Eye:** Excessive exposure to high concentrations of dust may cause irritation to the eyes. Particles of iron or iron compounds, which become imbedded in the eye, may cause rust stains unless removed fairly promptly. Torch or burning operations on steel products with surface treatments, oil coatings, or acrylic films may produce emissions that can be irritating to the eyes.

- **Skin:** Skin contact with dusts may cause irritation or sensitization, possibly leading to dermatitis. Repeated or prolonged contact with chemical surface treatments or oil residue may cause skin irritation, dermatitis, ulceration or allergic reactions in sensitized individuals.
- **Ingestion:** Ingestion of harmful amounts of this product as distributed is unlikely due to its solid insoluble form. Ingestion of dust may cause nausea and/or vomiting.

**Chronic Effects:** Chronic inhalation of metallic fumes and dusts are associated with the following conditions:

- **IRON OXIDE:** Chronic inhalation of excessive concentrations of iron oxide fumes or dusts may result in the development of a benign pneumoconiosis, called siderosis, which is observable as an X-ray change. No physical impairment of lung function has been associated with siderosis.
- **CALCIUM:** Depending on the concentration and duration of exposure, repeated or prolonged inhalation may cause inflammation of the respiratory passages, ulcers of the mucous membranes, and possible perforation of the nasal septum. Repeated or prolonged skin contact may cause dermatitis.
- **CARBON:** Chronic inhalation of high concentrations to carbon may cause pulmonary disorders.
- **COPPER:** Skin contact with dusts may cause irritation or sensitization, possibly leading to dermatitis. Repeated or prolonged contact with surface treatments or oil residue may cause skin irritation, dermatitis, ulceration or allergic reactions in sensitized individuals.
- **MANGANESE:** Chronic exposure to high concentrations of manganese fumes and dusts may adversely affect the central nervous system with symptoms including languor, sleepiness, weakness, emotional disturbances, spastic gait, mask-like facial expression and paralysis. Animal studies indicate that manganese exposure may increase susceptibility to bacterial and viral infections.
- **PHOSPHOROUS:** Inhalation of dusts and fumes of ferrophosphorus and phosphorous oxides may cause respiratory irritation.
- **SILICON:** Silicon dusts are a low health risk by inhalation and should be treated as a nuisance dust.
- **SULFUR:** Sulfur compounds, present in the fumes, may irritate the skin, eyes, lungs and gastrointestinal tract.
- **ALUMINUM:** Aluminum dusts/fines are a low health risk by inhalation and should be treated as a nuisance dust.
- **ANTIMONY:** Exposure to high concentrations of antimony dust or fumes can cause inflammation of the skin and mucous membranes, headache, dizziness, sleeplessness, bitter taste, nausea, vomiting, diarrhea, abdominal cramps, muscular pains, enlarged liver, pharyngitis, bronchitis, pneumonia.
- **LEAD:** Lead is classified among the highly toxic heavy metals. It is a cumulative hazard (accumulates in the bone and body tissue) and is a systemic poison that may affect a variety of organ systems, including the central nervous system, kidneys, reproductive system, blood formation, and gastrointestinal tract. Symptoms of chronic over-exposure include loss of appetite, nausea, metallic taste in the mouth, constipation, anxiety, anemia, fatigue, headache, muscle and joint pain, and colic accompanied by severe abdominal pain. Paralysis of the extensor muscles of the arms or legs, with wrist and/or foot drop, may result if the peripheral nervous system is affected. Long-term over-exposure may produce kidney damage. Reproductive damage is characterized by decreased sex drive, impotence, and sterility in men; and decreased fertility, abnormal menstrual cycles, and miscarriages in women. Unborn children may suffer neurological damage or developmental problems due to excessive lead exposure in pregnant women. Prolonged or repeated skin contact to lead dust may result in dermatitis. Systemic toxicity may develop if lead is transferred to the mouth by cigarettes, chewing tobacco, food or make-up. Prolonged eye contact may cause conjunctivitis.
- **ZINC:** Latent liver dysfunction and gastrointestinal disturbances with pressure in the stomach region, nausea, and weakness have been reported from repeated inhalation zinc oxide. Repeated or prolonged skin contact to zinc oxide, coupled with poor personal hygiene, may result in "oxide pox" due to clogging of sebaceous glands. "Oxide pox", especially localized to moist areas, is characterized by small red, hard projecting papules with a central white plug, which develops into a pustule with intense itching. The lesions usually clear within 7-10 days. Repeated or prolonged eye contact with zinc oxide fume may produce conjunctivitis.

Long-term inhalation exposure to high concentrations (over-exposure) to pneumoconiotic agents may act synergistically with inhalation of oxides, fumes or dusts of this product to cause toxic effects.

**Chemical Surface Treatments/Coatings:** The possible presence of chemical surface treatments and oil coatings should be considered when evaluating potential employee health hazards and exposures during handling and welding or other fume generating activities. Removal of surface coatings should be considered prior to such activities. Repeated or prolonged contact with chemical surface treatments or oil residue may cause skin irritation, dermatitis, ulceration or allergic reactions in sensitized individuals. Torching or burning operations on steel products with surface treatments, oil coatings or acrylic films may produce emissions that can be irritating to the eyes and respiratory tract. Inhalation of hexavalent chromium compounds may cause ulceration of the mucous membranes of the nasal septum and has been related to an increased incidence of lung cancer.

**Carcinogenicity:** The International Agency for Research on Cancer (IARC), the National Toxicology Program (NTP), and OSHA do not list steel products as carcinogens. IARC identifies lead and welding fumes as Group 2B carcinogens (possibly carcinogenic to humans). EPA lists lead as Group B2 (probable human carcinogen) based on a combination of sufficient evidence in animals and inadequate evidence in humans. When specified, a hexavalent chromium passivation treatment is applied to the product surface. IARC lists hexavalent chromium compounds as Group 1 (sufficient evidence for carcinogenicity in humans). NTP lists certain hexavalent chromium compounds as Group 1 (known to be carcinogenic). The American Conference of Governmental Industrial Hygienists (ACGIH) lists hexavalent chromium compounds as A1 (confirmed human carcinogen).

**Medical Conditions Aggravated by Long-Term Exposure:** Individuals with chronic respiratory disorders (i.e., asthma, chronic bronchitis, emphysema, etc.) may be adversely affected by any fume or airborne particulate matter exposure.

**SARA Potential Hazard Categories:** Immediate Acute Health Hazard; Delayed Chronic Health Hazard.

#### Section 4 - First Aid Measures

**Inhalation:** For over-exposure to airborne fumes and particulate, remove exposed person to fresh air. If breathing is difficult or has stopped, administer artificial respiration or oxygen as indicated. Seek medical attention promptly. Metal fume fever may be treated by bed rest, and administering a pain and fever reducing medication.

**Eye Contact:** Flush with large amounts of clean water to remove particles. Seek medical attention if irritation persists.

**Skin Contact:** Remove contaminated clothing. Wash affected areas with soap or mild detergent and water. If thermal burn has occurred, flush area with cold water and seek medical attention. If a persistent rash or irritation occurs, seek medical attention.

**Ingestion:** Not a probable route of industrial exposure. However, if ingested, seek medical attention immediately.

#### Section 5 - Fire-Fighting Measures

**Flash Point:** Not applicable

**LEL:** Not applicable

**Flash Point Method:** Not applicable

**UEL:** Not applicable

**Burning Rate:** Not applicable

**Auto-ignition Temperature:** Not applicable

**Flammability Classification:** Non-flammable, non-combustible

**Extinguishing Media:** Not applicable for solid product. Use extinguishers appropriate for surrounding materials.

**Unusual Fire or Explosion Hazards:** Not applicable for solid product. Do not use water on molten metal.

**Hazardous Combustion Products:** At temperatures above the melting point, fumes containing metal oxides and other alloying elements may be liberated.

**Fire-Fighting Instructions:** Do not release runoff from fire control methods to sewers or waterways.

**Fire-Fighting Equipment:** Wear a self-contained breathing apparatus (SCBA) with a full facepiece operated in pressure-demand or positive-pressure mode and full protective clothing.

#### Section 6 - Accidental Release Measures

**Spill /Leak Procedures:** Not applicable to steel in solid state. For spills involving finely divided particles, clean-up personnel should be protected against contact with eyes and skin. If material is in a dry state, avoid inhalation of dust. Fine, dry material should be removed by vacuuming or wet sweeping methods to prevent spreading of dust. Avoid using compressed air. Do not release into sewers or waterways. Collect material in appropriate, labeled containers for recovery or disposal in accordance with federal, state, and local regulations.

**Regulatory Requirements:** Follow applicable OSHA regulations (29 CFR 1910.120) and all other pertinent state and federal requirements.

**Disposal:** Contact your supplier or a licensed contractor for detailed recommendations. Follow applicable Federal, state, and local regulations.

#### Section 7 - Handling and Storage

**Handling Precautions:** Operations with the potential for generating high concentrations of airborne particulates should be evaluated and controlled as necessary. Practice good housekeeping. Avoid breathing metal fumes and/or dust.

**Storage Requirements:** Store away from acids and incompatible materials.

#### Section 8 - Exposure Controls / Personal Protection

**Engineering Controls:** Use controls as appropriate to minimize exposure to metal fumes and dusts during handling operations.

**Ventilation:** Provide general or local exhaust ventilation systems to minimize airborne concentrations. Local exhaust ventilation is preferred because it prevents contaminant dispersion into the work area by controlling it at its source.

**Administrative Controls:** Do not use compressed air to clean-up spills.

**Respiratory Protection:** Seek professional advice prior to respirator selection and use. Follow OSHA respirator regulations (29 CFR 1910.134) and, if necessary, wear a NIOSH-approved respirator. Select respirator based on its suitability to provide adequate worker protection for given working conditions, level of airborne contamination, and presence of sufficient oxygen.

**Protective Clothing/Equipment:** For operations which result in elevating the temperature of the product to or above its melting point or result in the generation of airborne particulates, use protective clothing, gloves and safety glasses to prevent skin and eye contact. Contact lenses should not be worn where industrial exposures to this material are likely. Use safety glasses or goggles as required for welding, burning, sawing, brazing, grinding or machining operations. Protective gloves should be worn as required for welding, burning or handling operations. Where the surface treatments are applied to the product, wear gloves when handling. Do not continue to use gloves or work clothing that has become saturated or soaked through with oil coating. Wash skin that has been exposed to oil with soap and water or waterless hand cleaner.

## Section 9 - Physical and Chemical Properties

|   |  |
|---|--|
| <p><b>Physical State:</b> Solid</p> <p><b>Appearance and Odor:</b> Metallic Gray, Odorless</p> <p><b>Odor Threshold:</b> Not applicable</p> <p><b>Vapor Pressure:</b> Not applicable</p> <p><b>Vapor Density (Air=1) :</b> Not applicable</p> <p><b>Formula Weight:</b> Not applicable</p> <p><b>Density:</b> 7.85 g/cc</p> <p><b>Specific Gravity (H<sub>2</sub>O=1, at 4 °C):</b> 7.85</p> <p><b>pH:</b> Not applicable</p> | <p><b>Water Solubility:</b> Insoluble</p> <p><b>Other Solubilities:</b> Not applicable</p> <p><b>Boiling Point:</b> Not applicable</p> <p><b>Viscosity:</b> Not applicable</p> <p><b>Refractive Index:</b> Not applicable</p> <p><b>Surface Tension:</b> Not applicable</p> <p><b>% Volatile:</b> Not applicable</p> <p><b>Evaporation Rate:</b> Not applicable</p> <p><b>Freezing/Melting Point:</b> Base Metal – 2750 °F<br/>Metallic Coating – 800-900 °F</p> |
|---|--|

## Section 10 - Stability and Reactivity

**Stability:** Steel products are stable under normal storage and handling conditions.

**Polymerization:** Hazardous polymerization cannot occur.

**Chemical Incompatibilities:** Will react with strong acids to form hydrogen. Iron oxide dusts in contact with calcium hypochlorite evolve oxygen and may cause an explosion.

**Conditions to Avoid:** Storage with strong acids or calcium hypochlorite.

**Hazardous Decomposition Products:** Thermal oxidative decomposition of galvanized steel products can produce fumes containing oxides of zinc, iron and manganese as well as other elements.

## Section 11 - Toxicological Information

No information is available for galvanized steel sheet as a mixture. The possible presence of chemical surface treatments and coatings should be considered when evaluating potential employee health hazards and exposures during handling and welding or other fume generating activities.

**Eye Effects:**

Eye contact with the individual components may cause particulate irritation. Implantation of iron particles in guinea pig corneas has resulted in rust rings with corneal softening about rust ring. Repeated or prolonged eye contact with zinc oxide fume may produce conjunctivitis.

**Skin Effects:**

Skin contact with the individual dust components may cause physical abrasion, irritation and dermatitis.

**Toxicity Data:\***

**Acute Inhalation Effects:**

Inhalation of the individual alloy components has been shown to cause various respiratory effects.

**Acute Oral Effects:**

No data available

**Other:** No LC50 or LD50 has been established for the mixture as a whole.

Iron LD50: 30 g/kg oral (rat). Calcium LD50: No data. Carbon LD50: No data. Copper TD<sub>Lo</sub>: 120 ug/kg oral (human). Manganese LD50: 9 g/kg oral (rat). Phosphorous LD50: No data. Silicon LD50: 3160 mg/kg oral (rat). Sulfur LD: >8437 mg/kg oral (rat). Aluminum LD50: No data. Antimony LD50: No data. Lead TD<sub>Lo</sub>: 450 mg/kg/6 yrs. oral (human). Zinc TC<sub>Lo</sub>: 124 mg/m<sup>3</sup>/50 min. inhalation (human).

**Chronic Effects:** See Section 3.

**Carcinogenicity:** Lead; Chromium (in surface passivation treatment, if specified).

**Mutagenicity:** No data available

**Teratogenicity:** No data available

\* See NIOSH, RTECS: (NO4565500) for additional toxicity data on iron; (EV8040000) for calcium, (FF5250000) for carbon; (GL5325000) for copper; (OO9275000) for manganese; (VW0400000) for silicon, (WS4250000) for sulfur; (BD0330000) for aluminum; (CC4025000) for antimony; (OF7525000) for lead; (ZG8600000) for zinc.

## Section 12 - Ecological Information

**Ecotoxicity:** No data available for galvanized steel sheet as a whole. However, individual components have been found to be toxic to the environment. Metal dusts may migrate into soil and groundwater and be ingested by wildlife. Lead can be bioaccumulated in plants and water organisms, especially shellfish.

**Environmental Fate:** No data available.

**Environmental Degradation:** No data available.

**Soil Absorption/Mobility:** No data available for galvanized steel sheet as a whole. However, individual components have been found to be absorbed by plants from soil.

### Section 13 - Disposal Considerations

**Disposal:** Steel scrap should be recycled whenever possible. Product dusts and fumes from processing operations should also be recycled, or classified by a competent environmental professional and disposed of in accordance with applicable federal, state or local regulations.  
**Container Cleaning and Disposal:** Follow applicable Federal, state and local regulations. Observe safe handling precautions.

### Section 14 - Transport Information

#### DOT Transportation Data (49 CFR 172.101):

Galvanized steel sheet and UPL.GalXC are not listed as hazardous substances under 49 CFR 172.101.

|  |   |  |
|--|---|--|
| <b>Shipping Name:</b> Not applicable<br><b>Shipping Symbols:</b> Not applicable<br><b>Hazard Class:</b> Not applicable<br><b>ID No.:</b> Not applicable<br><b>Packing Group:</b> Not applicable<br><b>Label:</b> Not applicable<br><b>Special Provisions (172.102):</b> None | <b>Packaging Authorizations</b><br><b>a) Exceptions:</b> None<br><b>b) Non-bulk Packaging:</b> Not applicable<br><b>c) Bulk Packaging:</b> Not applicable | <b>Quantity Limitations</b><br><b>a) Passenger, Aircraft, or Railcar:</b> Not applicable<br><b>b) Cargo Aircraft Only:</b> Not applicable<br><br><b>Vessel Stowage Requirements</b><br><b>a) Vessel Stowage:</b> Not applicable<br><b>b) Other:</b> Not applicable |
|--|---|--|

### Section 15 - Regulatory Information

**Regulatory Information:** *The following listing of regulations relating to a USS-POSCO Industries product may not be complete and should not be solely relied upon for all regulatory compliance responsibilities.*

This product and/or its constituents are subject to the following regulations:

**OSHA Regulations:**

Air Contaminant (29 CFR 1910.1000, Table Z-1, Z-1-A): The product as a whole is not listed. However, individual components of the product are listed.

OSHA Specifically Regulated Substance: Lead (29 CFR 1910.1025).

**EPA Regulations:**

RCRA (40CFR261): Steel scrap is not regulated as a solid waste or a hazardous waste under this act. If product dusts and/or fumes from processing operations are not recycled, they are considered to be a solid waste and may be classified as a hazardous waste depending on the toxicity characteristics of the dust as defined within 40CFR261.24.

CERCLA Hazardous Substance (40 CFR 302.4): The product as a whole is not listed. However, individual components of the product are listed: Antimony (Reportable Quantity (RQ)-5000#), Copper (RQ-5000#), and Lead(RQ-10#). Manganese compounds are also listed although no reportable quantity is assigned to this generic or broad class.

SARA 311/312 Codes (40CFR370): Immediate (acute) health hazard and delayed (chronic) health hazard.

SARA 313 (40CFR372.65): Zinc Compounds are subject to SARA 313 reporting requirements

**State Regulations:** The product as a whole is not listed in any state regulations. However, individual components of the product are listed in various state regulations.

Pennsylvania Right to Know: Contains regulated material in the following categories:

- Hazardous Substances: Calcium, Silicon and Sulfur.
- Environmental Hazards: Aluminum, Antimony, Copper, Lead, Manganese and Zinc.

New Jersey Right to Know: Contains regulated material in the following categories:

- Hazardous Substance: Aluminum (dust and fume), Antimony, Copper, Manganese and Sulfur.
- Special Health Hazard Substances: Lead.

California Prop. 65: This product may contain an extremely small amount of lead in the metallic coating. Per customer specification, an extremely small amount of hexavalent chromium passivation treatment may be applied to the surface of the galvanized steel product.

Lead and hexavalent chromium are materials known to the State of California to cause cancer or reproductive toxicity. In addition, the product may also possibly contain trace quantities (generally much less than 0.1%) of other metallic elements known to the State of California to cause cancer or reproductive toxicity. These include arsenic (inorganic), cadmium and nickel.

**Other Regulations:** The product as a whole is not listed in any state regulations. However, individual components of the product are listed in various state regulations.

**WHMIS Classification (Canadian):** D-2

**Section 16 - Other Information**

**Prepared By:** USS-POSCO Industries

**Hazard Rating Systems:**

NFPA Code: 1-0-0

HMIS Code: 1\*-0-0 PPE: See Section 8 \* Denotes possible chronic hazard if airborne dusts or fumes are generated.

**Disclaimer:** All information, recommendations, and suggestions appearing herein concerning this product are taken from sources or based upon data believed to be reliable. Although reasonable care has been taken in the preparation of this information, USS-POSCO Industries extends no warranties or guarantees, express or implied, makes no representations, and assumes no responsibility as to the accuracy, reliability or completeness of the information presented. Since the actual use of the product described herein is beyond our control, USS-POSCO Industries assumes no liability arising out of the use of the product by others. It is the user's responsibility to determine the suitability of the information presented herein, to assess the safety and toxicity of the product under their own conditions of use, and to comply with all applicable laws and regulations. Appropriate warnings and safe handling procedures should be provided to handlers and users.



**HAZARDOUS COMMUNICATION LABEL**



**CARBON STEEL-METALLIC COATING**

**WARNING!** CANCER HAZARD (CONTAINS LEAD AND/OR NICKEL).

EXPOSURE TO HIGH CONCENTRATIONS OF DUST OR FUME DURING WELDING, BURNING, MELTING, CUTTING, BRAZING, GRINDING AND POSSIBLY MACHINING, ETC., MAY PRODUCE IMMEDIATE OR DELAYED DAMAGE TO LUNGS OR OTHER ORGANS. EXPOSURE MAY ALSO CAUSE REPRODUCTIVE DISORDERS THROUGH INHALATION OR INGESTION OF LEAD.

EXCESSIVE INHALATION OF ZINC OXIDE FUMES FROM GALVANIZED PRODUCT (3C012) CAN PRODUCE AN ACUTE REACTION KNOWN AS “METAL FUME FEVER”, WITH FLU-LIKE SYMPTOMS LASTING FROM 12 TO 48 HOURS.

THIS PRODUCT MAY BE COATED WITH MATERIALS THAT COULD RESULT IN SKIN IRRITATION WITH PROLONGED CONTACT.

**PRECAUTIONS:** AVOID BREATHING OR INGESTING DUST OR FUME. ADEQUATE VENTILATION IS REQUIRED WHILE WELDING, BURNING, MELTING, CUTTING, BRAZING, GRINDING AND MACHINING.

AVOID SKIN CONTACT IF MATERIAL IS COATED.

**FIRST AID:** FOR OVEREXPOSURE TO AIRBORNE DUST AND FUME, REMOVE EXPOSED PERSON TO FRESH AIR. IF BREATHING IS DIFFICULT OR HAS STOPPED, ADMINISTER ARTIFICIAL RESPIRATION OR OXYGEN AS INDICATED. SEEK MEDICAL ATTENTION PROMPTLY.

IF PRODUCT IS COATED AND EXCESSIVE SKIN CONTACT OCCURS, WASH WITH SOAP AND WATER. IF IRRITATION DEVELOPS, SEEK MEDICAL ATTENTION.

USS-POSCO Industries, 900 Loveridge Rd., Pittsburg, CA 94565





## **Material Safety Data Sheet**

### **TruZinc® Steel**

**Article I.     Section 1 - Chemical Product and Company Identification**

**Product name**                     TruZinc® Steel

**Manufacturer**                    Steelscape, Inc.  
222 West Kalama River Road  
Kalama, WA 98625

**Revision Date**                    05/24/2012

**Reference No.**                    200000000002

**Emergency Contact:**            CHEMTREC (24 hours) 1-800-424-9300

**Section 2 - Composition / Information on Ingredients**

| Ingredient Name                     | CAS-No.   | Weight% |       |
|-------------------------------------|-----------|---------|-------|
|                                     |           | Min     | Max   |
| <b>Base Steel</b>                   |           |         |       |
| Iron                                | 7439-89-6 | Balance | 99.00 |
| Carbon                              | 7440-44-0 |         | 0.3   |
| Manganese Compounds (as Mn)         | 7439-96-5 |         | 1.2   |
| Phosphorus                          | 7723-14-0 |         | 0.15  |
| Sulfur                              | 7704-34-9 |         | 0.05  |
| Silicon                             | 7440-21-3 |         | 0.05  |
| Aluminum                            | 7429-90-5 |         | 0.1   |
| Base metal will vary.               |           |         |       |
| <b>Metallic Coating</b>             |           |         |       |
| Aluminum                            | 7429-90-5 | 0.10    | 0.50  |
| Zinc (Reportable as a fume or dust) | 7440-66-6 | 99.20   | 99.5  |
| Antimony & Compounds (as Sb)        | 7440-36-0 | 0.01    | 0.05  |
| Iron                                | 7439-89-6 |         | 0.02  |

**Hazards Identification****Emergency Overview**

Does not pose a health hazard in its normal form. Inhalation of metal dust and fume may result from further processing by the user, particularly during welding, burning, grinding and machining activities. These potential health hazards should be evaluated by the user. A non-metallic passivation treatment is normally applied based upon customer/end use criteria. These non-metallic coatings may contain hazardous substances of varying amounts. During processing, substances of varying chemical composition and quantity may be generated by the surface passivant. MSDS information regarding the surface passivant shall be supplied to the user upon request.

**Carcinogeny:**

Certain chromium and nickel compounds as well as organic compounds found in various coating materials have been listed as carcinogens by the NTP, IARC, or OSHA.

**Medical Conditions Aggravated by Long Term Exposure:**

Individuals with chronic respiratory disorders (i.e., asthma, chronic bronchitis, emphysema, etc.) may be adversely affected by any fume or airborne particulate matter exposure.

**Chronic Effects:**

Chronic inhalation 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. Chronic inhalation concentrations of aluminum fumes or dusts may lead to a fibrotic lung condition known as Shaver's disease; however, evidence for this is not conclusive since affected workers were exposed to other substances (silica) as well. The inhalation of high concentrations of dust from 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 mouth, dryness and irritation of the throat, followed by weakness, muscle pain, fever and chills. Continuous exposures to high concentrations of manganese can cause central nervous system disorders and manganese pneumonia. Fibrosis of lung tissue from manganese exposure has also been reported for products containing manganese only. Overexposure to aluminum dust can cause shortness of breath. Long term inhalation exposure to high concentrations (overexposure) to pneumoconiotic agents may act synergistically with inhalation of oxides, fumes or dusts of this product to cause toxic effects. Prolonged or repeated contact with unprotected skin may result in skin irritation. Torching or burning operations on steel products with oil or organic coating may produce emissions which can be irritating to the eyes and respiratory tract.

**Article III. Section 4 - First Aid Measures****Eye contact:**

Treat any foreign body in eye by flushing with large amounts of water. Seek medical attention immediately.

**Skin contact:**

Skin hazards are not expected. However, should dermatitis develop, affected area should be washed with mild soap and water. If irritation or other symptoms develop, seek medical attention. Precautions should be taken to protect against sharp steel edges. If the skin is abraded by handling, seek medical attention.

**Ingestion:**

Ingestion hazards are not expected.

**Inhalation:**

For treatment of overexposure to fumes and/or particulates, remove exposed individual to fresh air and seek medical attention. Administer artificial respiration or oxygen if breathing is difficult or has stopped.

#### **Article IV. Section 5 - Fire-Fighting Measures**

Not flammable or combustible. Steel products in the solid state present no fire or explosion hazard and do not contribute to the combustion of other materials.

#### **Article V. Section 6 - Accidental Release Measures**

Not applicable to steel in solid state. For spills involving finely divided particles, clean-up personnel should be protected against contact with eyes and skin. If material is in a dry state, avoid inhalation of dust. Fine, dry material should be removed by vacuuming or wet sweeping methods to prevent spreading of dust. Avoid using compressed air. Do not release into sewers or waterways. Collect material in appropriate, labeled containers for recovery or disposal in accordance with federal, state, and local regulations.

#### **Article VI. Section 7 - Handling and Storage**

Operations with the potential for generating high concentrations of airborne particulates should be evaluated and controlled as necessary. Practice good housekeeping. Avoid breathing metal fumes and/or dust.

#### **Article VII. Section 8 - Exposure Controls / Personal Protection**

##### **Respiratory protection:**

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

##### **Hand protection:**

Protective gloves should be worn as required for welding, burning or handling operations. If material is supplied with oil or other organic coating, wear protective gloves. However, do not continue to use gloves or work clothing that have become saturated with oil. Wash hands and any additional contact areas with soap and water or waterless hand cleaner.

##### **Eye protection:**

Use safety glasses or goggles as required for welding, burning, sawing, brazing, grinding or machining operations.

##### **Engineering measures:**

Local exhaust ventilation should be provided when welding, burning, sawing, brazing, grinding or machining to prevent excessive dust or fume exposure.

##### **Personal protection equipment:**

Operations with the potential for generating high concentrations of airborne particulates should be evaluated and controlled as necessary. Avoid breathing metal fumes and/or dust.

#### **Article VIII. Section 9 - Physical and Chemical Properties**

**Physical State:** N/A

**Appearance:** Silver, bright crystalline appearance.

**Odor:** None

**Vapor Pressure (mm Hg):** N/A

**Vapor Density (air = 1):** N/A

**Formula Weight:** N/A

**Density:** N/A

**Sp. Gravity(H<sub>2</sub>O = 1):** 7.8000N/A

**pH:** N/A

**Water Solubility:** Insoluble

**Other Solubilities:** N/A

**Boiling point/range:** N/A

**Freezing/Melting Point:** N/A

**Viscosity:** N/A

**Refractive Index:** N/A

**Surface Tension:** N/A

**% Volatile:** N/A

**Evaporation Rate:**

#### **Article IX. Section 10 - Stability and Reactivity**

##### **Chemical Stability:**

Stable under normal conditions of use, storage and transport.

##### **Hazardous Conditions to Avoid:**

Will react with strong acid to liberate hydrogen. Finely divided material may react with water, strong oxidizers, alkaline, and hydrogenated compounds. At temperatures exceeding the melting point of

the metallic coating, fumes may be liberated which contain oxides of the metallic coating constituents. At temperatures exceeding the melting point of the base metal, fumes may be liberated which contain oxides of iron and other steel alloying elements.

**Article X. Section 11 - Toxicological Information**

| <b>Ingredient Name</b>                 | <b>LD50 or LC50<br/>Species /Route</b> | <b>OSHA PEL</b>                        | <b>ACGIH TLV(mg/m3)<br/>(TWA unless specified)</b>  |
|--|--|--|---|
| <b>Base Steel</b>                      |  |  |   |
| Iron                                   | mouse/oral 5.4 mg/kg                   | 10 Iron Oxide Fume                     | 5 Iron Oxide Fume as Fe                             |
| Carbon                                 | No Information                         | Not Established                        | Not Established                                     |
| Manganese<br>Compounds (as Mn)         | rat/oral 9 mg/kg                       | 5 ceiling as Mn                        | 5 Dust as Mn<br>1 Fume as Mn<br>3 Fume as Mn (STEL) |
| Phosphorus                             | No Information                         | .1 Total                               | Not Established                                     |
| Sulfur                                 | No Information                         | 15 Total Dust                          | 13 as SO2   |
| Silicon                                | No Information                         | 15 Total Dust<br>5 Respirable Fraction | 10 Total  |
| Aluminum                               | No Information                         | 10 Total Dust<br>5 Respirable Fraction | 10 Metal Dust as Al                                 |
| <b>Metallic Coating</b>                |  |  |   |
| Aluminum                               | No Information                         | 10 Total Dust<br>5 Respirable Fraction | 10 Metal Dust as Al                                 |
| Zinc (Reportable as a<br>fume or dust) | No Information                         | 5 Fume as ZnO                          | 5 Fume as ZnO                                       |
| Antimony &<br>Compounds (as Sb)        | No Information                         | .5 TWA                                 | .5 TWA  |
| Iron                                   | mouse/oral 5.4 mg/kg                   | 10 Iron Oxide Fume                     | 5 Iron Oxide Fume as Fe                             |

**Article XI. Section 12 - Ecological Information**

No data available for product as a whole. However, individual components have been found to be toxic to the environment. Metal dusts may migrate into soil and groundwater and be ingested by wildlife. Lead can be bioaccumulated in plants and water organisms, especially shellfish.

**Article XII. Section 13 - Disposal Consideration**

Steel scrap should be recycled whenever possible. Product dusts and fumes from processing operations should also be recycled, or classified by a competent environmental professional and disposed of in accordance with applicable federal, state or local regulations.

**Article XIII. Section 14 - Transport Information**

Not listed as a hazardous substance under 49 CFR 172.101.

**Article XIV. Section 15 - Regulatory Information**

SARA 311/312 Codes (40CFR370): Immediate (acute) health hazard and delayed (chronic) health hazard. SARA 313 (40CFR372.65): Manganese and Lead are subject to SARA 313 reporting requirements. Please note that if you prepackage or redistribute this product to industrial customers, SARA 313 requires that a notice be sent to those customers.

Air Contaminant (29 CFR 1910.1000, Table Z-1, Z-1-A): The product as a whole is not listed. However, individual components of the product are listed. OSHA Specifically Regulated Substance: Lead (29 CFR 1910.1025).

## **Article XV. Section 16 - Other Information**

### **Proposition 65 Statement:**

WARNING: This product may contain chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.

This Material Safety Data Sheet (MSDS) has been prepared in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200) and the Supplier Notification Requirements of SARA Title III, Section 313. This MSDS represents products which may contain toxic chemicals.

The information contained in this MSDS was obtained from sources which are believed to be reliable by the manufacturer. However, the information is provided without any responsibility or warranty, expressed or implied regarding its accuracy or correctness. The conditions or methods of handling, storage, use and disposal of this product are beyond the knowledge of the manufacturer. For this and other reasons, the manufacturer does not assume responsibility and expressly disclaims liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of this product.