

MATERIAL SAFETY DATA SHEET

Section 1: Product/Company Information

Identity: Stainless Steel Chips, Stainless Steel Powder

Mfg. Name: Powder Technology Inc.
14331 Ewing Avenue S.
Burnsville, MN 55306

Emergency Number: (952) 894-8737
Number for Info: (952) 894-8737
Date Updated: 7 June 2011

Section 2: Composition Information

Chemical	CAS Number	% Weight	ACGIH/TLV (mg/m ³)	OSHA/PEL (mg/m ³)
Base Metal:				
Iron	7439-89-6	Balance	5	10
Alloying Elements:				
Aluminum	7429-90-5	0-0.65	10.0	15.0
Antimony	7440-36-0	<1.0	0.5	0.5
Arsenic	7440-38-2	<1.0	0.01	0.01
Beryllium	7440-41-7	<1.0	0.002	0.002
Boron	7440-41-7	<1.0	10.0	15.0
Cadmium	7440-43-9	<1.0	0.01	0.005
Calcium	1305-78-8	0-1.0	2.0	5.0
Carbon	7440-44-0	<0.95	Not established	Not established
Chromium	7440-47-3	10.5-18.5	0.5	1.0
Cobalt	7440-48-4	0-1.0	0.02	0.1
Copper	7440-50-8	0-2.0	1.0	1.0
Lead	7439-92-1	<0.1	0.05	0.05
Magnesium	7439-95-4	<1.0	Not established	Not established
Manganese	7439-96-5	0.15-1.0	0.2	5.0
Molybdenum	7439-98-7	0-0.12	10.0	15.0
Niobium	7440-03-1	0-0.05	Not established	Not established
Nickel	7440-02-0	0-0.3	1.5	1.0
Nitrogen	7727-37-9	0.004-0.03	Simple Asphyxiant	Simple Asphyxiant
Phosphorous	7723-14-0	0-0.04	0.1	0.1
Selenium	7782-49-2	<1.0	0.2	0.2
Silicon	7440-21-3	0.25-0.8	10.0	15.0
Sulfur	7446-09-05	<0.05	5.2	13.0
Tin	7723-14-0	0-0.04	2.0	2.0
Titanium	7440-32-6	0-0.35	Not established	Not established
Tungsten	7440-33-7	<1.0	5.0	Not established
Vanadium	7440-62-2	0-0.15	0.05	0.5
Zinc	7440-66-6	<0.01	10.0	10.0

Note: The above is a summary of elements used in alloying stainless steels. Various grades of stainless steel will contain different combinations of the listed elements and/or trace materials. No permissible exposure limits (PEL) or threshold limit values (TLV) exist for stainless steel, values shown are applicable to component elements.

Section 3: Hazards Identification

Potential Health 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 and copper have been associated with causing metal fume fever.
- **Eye:** Dusts or particulates may cause mechanical irritation including pain, tearing and redness. Scratching of the cornea can occur if eye is rubbed.
- **Skin:** Dusts or particulates may cause mechanical irritation due to abrasion. Some components in this product are capable of causing an allergic reaction.
- **Ingestion:** Ingestion of harmful amounts of this product as distributed is unlikely due to its solid insoluble form. Ingestion of dust may cause nausea or vomiting.

Chronic Effects: Chronic inhalation of metallic fumes and dusts are associated with the following conditions: Inflammation of the nasal mucosa and can cause changes to the lungs. A red-brown pigmentation of the eye and/or skin may occur.

Carcinogenicity: This product contains elements known to the state of California to cause cancer (antimony, arsenic, beryllium, chromium, cobalt, cadmium, lead and nickel)

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

Section 4: Emergency and First Aid

- **Eyes:** Flush eyes with plenty of water, lifting the upper and lower eyelids. Seek medical attention if irritation continues.
- **Skin:** Wash skin with soap and water. Get medical attention if irritation develops or persists.
- **Inhalation:** Move exposed person to fresh air. Perform artificial respiration if breathing has stopped. Seek medical attention.
- **Ingestion:** If excessive amounts are ingested seek medical attention.

Section 5: Hazard Identification

- **Flash Point:** Not applicable
- **LEL:** Not applicable
- **UEL:** Not applicable
- **Burning Rate:** Not applicable
- **Auto-ignition Temperature:** Not applicable
- **Flammability Classification:** Chips: Non-flammable, non-combustible, Powder:
- **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. Powder may burn. Dust is an explosion hazard.
- **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 face-piece operated in pressure-demand or positive pressure mode and full protective clothing.

Section 6: Accidental Release Measures

Spill/Leak Procedures: 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. 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.

Section 7: Physical/Chemical Data

- **Physical State:** Solid
- **Appearance and Odor:** Metallic Gray, Odorless
- **Vapor Pressure:** Not applicable
- **Vapor Density (Air=1):** Not applicable
- **Density:** 8.03 gm/cm³
- **pH:** Not applicable
- **Water Solubility:** Insoluble
- **Other Solubilities:** Not applicable
- **Melting Point:** ~2550-2650 °F

Section 8: Exposure Control/Personal Protection

- **Ventilation:** Keep dust levels below occupational exposure limits. Use local exhaust ventilation if necessary.
- **Personal Protective Equipment:**
 - **Eyes:** Wear safety goggles or glasses with side shields.
 - **Skin:** None required. Protective gloves will minimize exposure.
 - **Inhalation:** Use local ventilation. Use OSHA approved respirator if required.

Section 9: Stability and Reactivity Data

- **Stability:** Stable under normal storage and handling conditions.
- **Polymerization:** Hazardous polymerization cannot occur.
- **Chemical Incompatibilities:** Will react with strong acids to form hydrogen.
- **Conditions to Avoid:** Storage with strong acids or calcium hypochlorite.
- **Hazardous Decomposition Products:** Thermal oxidative decomposition of steel products can produce fumes containing oxides of iron and manganese as well as other alloying elements.

Section 10: 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.

Section 11: Toxicological Information

- **Eye Effects:** Eye contact with the individual components may cause particulate irritation. Implantation of iron particles in guinea pig corneas have resulted in rust rings with corneal softening about rust ring.
- **Skin Effects:** Skin contact with the individual dust components may cause physical abrasion, irritation, dermatitis, and sensitization.
- **Acute Inhalation Effects:** Inhalation of the individual alloy components has been shown to cause various respiratory effects.
- **Acute Oral Effects:** No data available
- **Other:** Iron LD50: 30 g/kg oral (rat).
- **Chronic Effects:** See Section 3.
- **Carcinogenicity:** See Section 3.
- **Mutagenicity:** No data available
- **Teratogenicity:** No data available

Section 12: Ecological Information

- **Eco-toxicity:** No data available for the product as a whole. However, individual components of the product have been found to be toxic to the environment. Metal dusts may migrate into soil and groundwater and be ingested by wildlife.
- **Environmental Fate:** No data available.
- **Environmental Degradation:** No data available.

Section 13: Disposal Considerations

Steel scrap, dusts and fumes should be recycled whenever possible. All disposal methods must be in accordance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterization and compliance with applicable laws are the responsibility solely of the waste generator.

Section 14: Transportation Data

Not regulated by DOT.

Section 15: Other Regulatory Information

Toxic Substances Control Act (TSCA): Components of this product are listed on the TSCA inventory.

SARA, Title III Section 311/312 Hazard Categories: Immediate Health Effect, Delayed Health Effect

Note: The regulatory information contained in this MSDS is not intended to be comprehensive.

Section 16: Other Information

The information and recommendations contained herein are based upon data believed to be correct. However, no guarantee or warranty of any kind, express or implied, is made with respect to the information contained herein. It is the user's obligation to determine the conditions of safe use of this product.