

**MATERIAL SAFETY DATA SHEET**  
**Stainless Steel (301, 302, 304, 304L, 305,**  
**309, 310, 310S, 316, 316L, 321, 347, 350,**  
**430, 17-7PH, 18SR)**



**1. IDENTIFICATION OF THE SUBSTANCE/PREPARATIONS AND OF THE COMPANY UNDERTAKING**

Product Name	Stainless Steel 301, 302, 304, 304L, 305, 309, 310, 310S, 316, 316L 321, 347, 350, 430, 17-7PH, 18SR
UNS Number(s)	S30100, S30200, S30400, S30403, S30500, S30908, S31000, S31008, S31600, S31603, S32100, S34700, S35000, S43000, S17700, S43035
Product Description	Coil, sheet or strip metal
Manufacturer/Supplier	Zapp Precision Strip, Inc.
Address	266 Barnet Blvd., Dartmouth , MA 02745
Phone Number	508-988-6300
Emergency Phone Number	888-647-3700
MSDS First Issued	December 12, 2008
MSDS Date Revised	January 25, 2011
Safety Data Sheet according to EC directive 2001/59/EC and OSHA's Hazcom Standard (29 CFR 1910.1200)	

**2. HAZARDS IDENTIFICATION**

EU Main Hazards	Not classified as hazardous.
Emergency Overview	Warning! Welding, sawing, brazing, grinding and machining may cause hazardous dust and/or fume to be released. This product is sold as a solid and does not present an immediate health or fire hazard.
Routes of Entry	None for product as supplied.
Carcinogenic Status	Not considered carcinogenic by NTP, IARC, and OSHA.
Target Organs	Eye - Skin - Lung for exposure to dust/fume during processing. See section 11 for additional information.
Health Effects – Eyes	Sharp edges on solid products may cause cuts or lacerations. Contains nickel which may cause skin sensitization on contact. Contact with dust or fume created during processing may cause irritation.
Health Effects – Skin	Sharp edges on solid products may cause cuts or lacerations. Contact with dust or fume created during processing may cause irritation and skin sensitization.
Health Effect – Ingestion	Ingestion is not a route of exposure under normal conditions of use.

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Health Effects – Inhalation Prolonged or repeated exposure to dust or fume created from processing may cause irritation of nose, throat and respiratory tract, headache and dizziness. Long term inhalation of iron may cause siderosis, a build-up of iron in the lungs.

**3. COMPOSITION/INFORMATION ON INGREDIENTS**

Component Name	CAS #/EC#	Concentration	Classification	R Phrases
Iron	7439-89-6	> 45 %	None	None
	231-096-4			
Carbon	7440-44-0	≤ 0.25 %	None	None
	231-153-3			
Chromium	7440-47-3	16 - 26 %	None	None
	231-157-5			
Copper	7440-50-8	≤0.75 %	Xn, N	R20/22, R36/37/38, R50/53
	231-159-6			
Manganese	7439-96-5	≤2 %	None	None
	231-105-1			
Molybdenum	7439-98-7	≤3 %	None	None
	231-107-2			
Nitrogen	7727-37-9	≤ 0.11 %	None	None
	231-783-9			
Nickel	7440-02-0	≤22 %	T	R40, R43, R48/23
	231-111-4			
Niobium	7440-03-1	≤ 1 %	None	None
	231-113-5			
Phosphorus	7723-14-0	≤ 0.04 %	F, T+, C, N	R11, R16, R52/53
	231-768-7			
Sulfur	7704-34-9	≤ 0.03 %	Xi	R38
	231-722-6			
Silicon	7440-21-3	≤1.5 %	None	None
	231-130-8			
Aluminum	7429-90-5	≤3.0 %	F	R11, R15
	231-072-3			
Titanium	7440-32-6	≤0.8 %	None	None
	231-142-3			

**4. FIRST- AID MEASURES**

First Aid – Eyes In case of injury to the eye, seek medical attention. If dust particles created by processing get into the eye, immediately flush eyes with large quantities of water for at least 15 minutes. Contact a physician.

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### 4. FIRST- AID MEASURES

First Aid – Skin	Seek medical help for serious cuts or lacerations or if irritation from contact with dusts persists.
First Aid – Ingestion	Not a route of exposure.
First Aid – Inhalation	For overexposure to airborne fumes and dusts created from processing, move to fresh air immediately and contact a physician.

### 5. FIRE - FIGHTING MEASURES

Extinguishing Media	For molten metal use dry powder or sand. Do not use water on molten metal. Use extinguishing media appropriate for surrounding materials.
Unusual Fire and Explosion Hazards	May release hazardous fumes during a fire.
Protective Equipment for Fire Fighting	Fire fighters should be equipped with self-contained breathing apparatus and full protective clothing to protect against potentially toxic and irritating fumes.

### 6. ACCIDENTAL RELEASE MEASURES

For spills of dusts or small particles use vacuum or wet sweep methods. Avoid contact with skin and eyes. Place in suitable container for disposal. Dispose of waste materials in accordance with all federal, state and local regulations. Avoid release to waterways.

### 7. HANDLING AND STORAGE

When processing, use in well ventilated area and use local exhaust ventilation. Avoid inhaling dust and fumes. Avoid contact with eyes, skin and clothing. Store away from acids.

### 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

#### Exposure Standards

Exposure Limits:	Iron as Iron Oxide:	ACGIH TLV: 5 mg/m <sup>3</sup> TWA, Measured as respirable fraction of the aerosol OSHA PEL: 10 mg/m <sup>3</sup> TWA fume
Exposure Limits:	Manganese, Fume, as Mn:	ACGIH TLV: 0.2 mg/m <sup>3</sup> TWA OSHA PEL: 5 mg/m <sup>3</sup> CEIL (C)
Exposure Limits:	Chromium Metal:	ACGIH TLV: 0.5 mg/m <sup>3</sup> TWA OSHA PEL: 1 mg/m <sup>3</sup> TWA
Exposure Limits:	Copper, Dusts and mists, as Cu:	ACGIH TLV: 1 mg/m <sup>3</sup> TWA OSHA PEL: 1 mg/m <sup>3</sup> TWA
Exposure Limits:	Nickel, Insoluble compounds, as Ni:	ACGIH TLV: 0.2 mg/m <sup>3</sup> TWA, Measured as inhalable fraction of the aerosol (Inorganic only)

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Exposure Limits:	Molybdenum and insoluble compounds, as Mo:	ACGIH TLV: 10mg/m <sup>3</sup> TWA, Measured as inhalable fraction of the aerosol ACGIH TLV: 3 mg/m <sup>3</sup> TWA, Measured as respirable fraction of the aerosol
Exposure Limits:	Silicon:	OSHA PEL: 15 mg/m <sup>3</sup> TWA Total dust 5 mg/m <sup>3</sup> TWA Respirable Fraction
Exposure Limits:	Aluminum, Metal(dust):	ACGIH TLV: 1 mg/m <sup>3</sup> TWA OSHA PEL: 15 mg/m <sup>3</sup> TWA Total dust 5 mg/m <sup>3</sup> TWA Respirable Fraction
Exposure Limits:	Phosphorus, sulfur and carbon as Particulates Not Otherwise Classified (PNOC)	OSHA PEL: 15 mg/m <sup>3</sup> TWA Total dust 5 mg/m <sup>3</sup> TWA Respirable Fraction
Engineering Control Measures	Engineering methods to prevent or control exposure are preferred. Methods include process or personnel enclosure, mechanical ventilation (dilution and local exhaust) especially during welding, grinding or cutting, and control of process conditions.	
Respiratory Protection	The specific respirator selected must be based on the airborne concentration found in the workplace and must not exceed the working limits of the respirator.	
Hand Protection	Protective gloves	
Eye Protection	Chemical goggles	
Body Protection	Normal workwear	

**9. PHYSICAL AND CHEMICAL PROPERTIES**

Physical State	Solid
Odor	None
Color	Gray
pH	No data available
Melting Point (°F)	~2800
Specific Gravity	No data available
Flash Point (°F)	Not flammable
Vapor Pressure (mm Hg @ 20°C)	Not applicable
Solubility in Water	Insoluble
VOC	Not applicable
Vapor Density (Air = 1)	Not applicable

**10. STABILITY AND REACTIVITY**

Stability	Stable under normal conditions.
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**10. STABILITY AND REACTIVITY**

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Conditions to Avoid	Contact with incompatible materials
Materials to Avoid	Strong acids
Hazardous Polymerization	Hazardous polymerization will not occur.
Hazardous Decomposition Products	Oxides of iron and alloying elements

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**11. TOXICOLOGY INFORMATION**

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Acute Toxicity	No relevant studies identified.
Chronic Toxicity/Carcinogenicity	Welding fumes: IARC Group 2B carcinogen (possibly carcinogenic to humans) Nickel: IARC Group 2B carcinogen (possibly carcinogenic to humans), NTP: Anticipated Carcinogen Contact with dust/fume from processing may cause respiratory sensitization (nickel) and skin sensitization (nickel, chromium, copper). Chronic exposure to ingredients contained in dust/fume from processing may cause adverse effects to the lungs, liver, kidneys and blood.
Genotoxicity	No relevant studies identified.
Reproductive/Developmental Toxicity	Chronic exposure to manganese dust may cause reproductive disorders.

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**12. ECOLOGICAL INFORMATION**

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Mobility	No relevant studies identified.
Persistence/Degradability	No relevant studies identified.
Bio-accumulation	No relevant studies identified.
Ecotoxicity	No relevant studies identified.

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**13. DISPOSAL CONSIDERATIONS**

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Dispose of in accordance with all applicable local, state and national regulations.

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**14. TRANSPORT INFORMATION**

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DOT CFR 172.101 Data	Not Regulated
Proper Shipping Name	Not Regulated
UN Class	Not Regulated
UN Number	Not Regulated
UN Packing Group	Not Regulated

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EU Label Information	Classification and labeling have been performed according to EU directives 67/548/EEC and 99/45/EC including amendments (2001/60/EC and 2006/8/EC)
EU Hazard Symbol and Indication of Danger	According to EC Commission Directive 67/548/EEC this product is not classified.
R Phrases	None
S Phrases	None
TSCA Listing	This product contains ingredients that are listed on or exempt from listing on the EPA Toxic Substance Control Act Chemical Inventory.
EINECS Listing	This product contains ingredients that are listed on the European Inventory of Existing Commercial Chemical Substances (EINECS) or are exempt from listing.
DSL (Canadian) Listing	This product contains ingredients that are listed on the Domestic Substance List (DSL) or are exempt from listing.
WHMIS Classification	D.2.A
MA Right to Know Law	This product contains the following chemicals on the Massachusetts Right to Know Law: Manganese – Carbon – Phosphorus – Chromium – Copper – Molybdenum – Nitrogen – Nickel – Silicon – Aluminum
PA Right to Know Law	This product contains the following chemicals on the Pennsylvania Right to Know Law: Manganese – Phosphorus – Chromium – Copper – Molybdenum – Nitrogen – Nickel – Silicon – Aluminum
NJ Right to Know Law	This product contains the following chemicals on the New Jersey Right to Know Law: Manganese – Phosphorus – Chromium – Copper – Molybdenum – Nickel – Silicon – Titanium – Aluminum
California Prop 65	This product contains the following materials which the State of California has found to cause cancer, birth defects or other reproductive harm: Nickel
SARA Title III Sect. 311/312	None
SARA Title III Sect. 313	This product contains the following chemicals that are listed in Section 313 at or above de minimis concentrations: Manganese – Chromium – Nickel – Aluminum

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NFPA Ratings	Health - 0 Flammability - 0 Reactivity - 0 Special Hazards – 0
HMIS Ratings	Health - 2* Flammability - 0 Reactivity - 0 Personal Protection - See Section 8 *for dust/fume created from processing

## Abbreviations

N/A: Denotes no applicable information found or available

CAS#: Chemical Abstracts Service Number

ACGIH: American Conference of Governmental Industrial Hygienists

OSHA: Occupational Safety and Health Administration

TLV: Threshold Limit Value (ACGIH)

PEL: Permissible Exposure Limit (OSHA)

STEL: Short Term Exposure Limit

NTP: National Toxicology Program

IARC: International Agency for Research on Cancer

NIOSH: National Institute of Occupational Safety and Health

LD50: Lethal Dose 50%

LC50: Lethal Concentration 50%

R11: Highly Flammable

R15: Contact with water liberates extremely flammable gases.

R17: Spontaneously flammable in air.

R16: Explosive when mixed with oxidizing substances.

R20/22: Harmful by inhalation and if swallowed.

R36/37/38: Irritating to eyes, respiratory system and skin.

R38: Irritating to skin.

R40: Limited evidence of a carcinogenic effect.

R43: May cause sensitization by skin contact.

R48/23: Toxic: Danger of serious damage to health by prolonged exposure through inhalation.

R50/53: Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Xi: Irritant

T+ : Very Toxic

F: Highly Flammable

C: Corrosive

N: Dangerous for the environment.

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**16. OTHER INFORMATION**

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Disclaimer

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