

SEVERSTAL WARREN

Severstal Warren, Inc.
999 Pine Ave., SE
Warren, Ohio 44483
Phone: (330) 841-8219

For additional information
Contact:
Severstal Warren, Inc.
Safety Department
Phone: (330) 841-8248

Material Safety Data Sheet

Severstal Warren, Inc.

1. Chemical Product and Company Identification

Product Name **Galvanized Steel**
Product Code..... **Galvanized Steel (See table for Grades)**

Culvert - ASTM A929 or AASHTO M218	CS, FS, DS, DDS, SS, SNA GRADES (SK)	HSLAS, HSLAS-F, UHSS SNA GRADES (XK, XF)
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Chemical Family.....N/A
Chemical Name.....N/A
Formula.....N/A

Manufacturer:
Severstal Warren, Inc.
999 Pine Avenue, SE
Warren, Ohio 44483-6528

Telephone Numbers:
Information.....(330) 841-8219
Emergency (330) 841-8248

2. Hazardous Ingredients

Concentrations for ingredients are expressed as % by weight.

Ingredient / CAS #	ASTM A929 , AASHTO M218	CS, FS, DS, DDS, SS, SNA GRADES (SK)	HSLAS, HSLAS-F ,UHSS SNA GRADES (XK, XF)
Iron 7439-89-6	80-98	88-99	88-96
Carbon 7440-44-0	0.10 maximum	0.40 maximum	0.15 maximum
Manganese 7439-96-5	0.60 maximum	1.70 maximum	2.00 maximum
Phosphorous 7723-14-0	0.025 maximum	0.040 maximum	0.040 maximum
Sulfur 7704-34-9	0.025 maximum	0.050 maximum	0.050 maximum
Silicon 7440-21-3	0.10 maximum	0.50 maximum	0.50 maximum
Aluminum 7429-90-5	0.12 maximum	0.15 maximum	0.15 maximum
Boron 7440-42-8	0.010 maximum (2)	0.010 maximum (2)	0.010 maximum (2)
Calcium 7440-70-2		0.010 maximum	0.010 maximum
Columbium 7440-03-1		0.02 maximum (3)	0.15 maximum
Copper 7440-50-8		0.99 maximum (1)	0.99 maximum (1)
Titanium 7440-32-6		0.25 maximum (3)	0.25 maximum
Vanadium 7440-62-2		0.02 maximum	0.15 maximum
Zirconium 7440-67-7		0.02 maximum	0.02 maximum
Zinc 7440-66-6	1.0-18.0 (4)	0.09-18.0 (4)	0.09-18.0 (4)
PVC 93050-82-9	0.3-1.5 (5)		

1. If specified
2. If Boron Stabilized
3. If Columbium-Titanium Stabilized
4. Applied as metallic coating
5. Applied as PVC coating if specified

The chemistries are provided for industrial hygiene and environmental purposes and are not intended to represent product specification. This information has been completed from data believed to be reliable. Elements such as arsenic, boron, calcium, cadmium, chromium, cobalt, copper, lead, molybdenum, nickel, tin, titanium, vanadium, and zirconium may be present in trace amounts. Steel products may be coated with petroleum oils to meet customer specifications. Information relative to specific coatings may be obtained from Severstal Warren, Inc. Steel products as shipped do not present an exposure hazard.

NOTE: Use gloves when handling this product to prevent skin irritation

3. Physical Characteristics

Physical Form	Solid
Color	Brown-Grey
Odor	None
Boiling Point	Not Applicable
Melting Point	2400-2800 F
pH	Not Applicable
Solubility in Water	Insoluble
Specific Gravity	7.5-8.5
Vapor Pressure	Not Applicable
Vapor Density	Not Applicable

4. Fire and Explosion Data

Steel products in the solid state present no fire or explosion hazard, However, the particulate generated may present a dust explosion hazard.

5. Reactivity

Stability	Stable
Hazardous Polymerization	Does not occur
Incompatibilities	None
Hazardous Decomposition/Byproducts	None

6. Accidental Release Measures

Spill or Leak Procedures.....Product is a solid material as shipped, no potential for spill or leak.
Waste Disposal.....Follow Federal, state, and local regulations.

7. Exposure Controls / Personal Protection

Protective Equipment.....The appropriate protective equipment (eye, face, hand) should be worn when burning, welding, brazing, grinding, or machining this product.

Respiratory Protection.....Use NIOSH/MSHA approved dust/mist respirators when generating particulates or fumes in accordance with 29CFR 1910.134.

Ventilation.....If your operation generates particulates when processing this product, local and general ventilation may be necessary to control employee exposures to within applicable limits.

8. Health Hazard Data

Routes of Entry: Inhalation

Symptoms of Overexposure:

Iron (Iron Oxide): Prolonged or repeated exposure to high concentrations may cause lung changes considered to be a benign pneumoconiosis (siderosis). Inhalation of iron oxide may cause irritation of eyes, nose, and throat, and metal fume fever.

Carbon: Primarily a nuisance dust. May cause mild irritation to the eyes and mucous membranes.

Manganese: Exposure may cause irritation of the eyes, nose, and throat, metallic taste in mouth, and metal fume fever. Advanced exposure symptoms may include weakness, sleepiness, nervousness, lack of coordination, uncontrollable laughter, mental confusion, speech disturbances, and aggressiveness. Manganese exposure may cause bronchitis, pneumonitis and central nervous system disturbances.

Silicon: Primarily a nuisance dust. May cause mild irritation to the eyes and mucous membranes.

Aluminum: Generally considered to be a nuisance particulate. May cause irritation to the upper respiratory tract, skin and eyes. Inhalation of fine particles may cause a pulmonary fibrosis known as Shaver's disease. Symptoms may include dyspnea, cough and fatigue. May be implicated in Alzheimer's disease.

Boron: May cause irritation of the eye, nose, and skin. Affects the central nervous, circulatory, and digestive systems. May cause circulatory depression, vomiting and diarrhea, followed by shock and coma. Body temperature may become subnormal and a erythematous rash may cover the entire body.

Calcium Oxide: Irritation of the eyes, nose, throat, and skin. May also cause severe skin burns, bronchitis and pneumonia. Repeated or prolonged exposures may result in dermatitis, ulceration and perforation of the nasal septum.

Copper: Irritation of the eyes, nose, throat and a metallic taste in the mouth. Exposures to high concentration may cause metal fume fever. Symptoms may include metallic taste in the mouth, dryness and irritation of the throat, cough, feeling of weakness, fatigue with fever, chills and profuse sweating. Symptoms generally occur 12-14 hours after exposure.

Titanium: Primarily a nuisance dust. May cause mild irritation to the eyes and mucous membranes.

Vanadium: Irritation of the respiratory tract and conjunctivae. Excessive exposure may result in skin pallor, greenish discoloration of the tongue, eczematous skin lesions, cough, bronchitis and chest pains. Long term exposure may cause pulmonary edema, pneumonia, chronic bronchitis, anemia, albuminuria and nervous complaints.

Zirconium: Generally considered to be of a low order of toxicity. Inhalation of zirconium dusts and fumes has caused no respiratory changes in humans. Animal studies suggest the possibility of interstitial pneumonitis, peribronchial abscesses, peribronchiolar granuloma and lobular pneumonia.

Zinc: Syndrome of metal fume fever. Symptoms may include metallic taste in mouth, dryness and irritation of throat, cough, feeling of weakness, fatigue with fever, chills, and profuse sweating. Symptoms generally occur 12-14 hours after exposure. May cause a dermatitis condition known as oxide pox.

PVC: Decomposition of PVC by heat may result in the release of vinyl chloride vapor and other irritants. May cause skin and mucous membrane irritation. Exposure may cause liver injury, nausea and central nervous system depression. Vinyl chloride has been found to be a human carcinogen.

Coating Oils: Steel coated with an oil may result in a mild skin irritation upon prolonged and repeated contact.

Carcinogenicity: Nickel, and chromium and some of their compounds are listed as carcinogens or potential carcinogens.

Medical Conditions Aggravated by Exposure: Current respiratory conditions can be aggravated by exposure.

Exposure limits:

Name	Exposure Limits	
	OSHA PEL / STEL	ACGIH TLV / STEL
Iron	10 mg/m ³	5 mg.m ³
Carbon	15 mg/m ³	10 mg/m ³
Manganese	0.2 mg/m ³	5 mg/m ³ ceiling
Phosphorous	0.1 mg/m ³	0.1 mg/m ³
Sulfur	15.0 mg/m ³	10 mg/m ³
Silicon	15 mg/m ³ total particulate 5 mg/m ³ respirable particulate	10 mg/m ³
Aluminum	15 mg/m ³ Total fraction 5 mg/m ³ respirable fraction	10 mg/m ³
Boron	15 mg/m ³ (as total dust)	10 mg/m ³
Calcium	5 mg/m ³ (as calcium oxide)	2 mg/m ³ (as calcium oxide)
Copper	1 mg/m ³	1 mg/m ³
Titanium	15 mg/m ³ (as titanium dioxide)	10 mg/m ³ (as titanium dioxide)
Vanadium	NE	NE
Zirconium	5 mg/m ³ (as Zr)	5 mg/m ³ (as Zr)
Zinc	15 mg/m ³ (as zinc oxide)	15 mg/m ³ (as zinc oxide)
PVC	NE	NE

- OSHA – U.S. Department of Labor Occupational Safety and Health Administration
- ACGIH – American Conference of Governmental Industrial Hygienists
- PEL – OSHA Permissible Exposure Limit (8-hour Time Weighted Average)
- STEL – OSHA and ACGIH Short term Exposure limit (15 minute exposure)
- TLV – ACGIH Threshold Limit Value (8-hour Time Weighted Average)
- Ceiling Limit – OSHA and ACGIH instantaneous exposure limit
- NE – No Exposure Limit Established

9. First Aid Measures

Eyes:...Flush eyes thoroughly with clean, lukewarm water for 15 minutes. Seek medical attention.

Skin:...Wash affected area with soap and water.

Inhalation:...Remove to fresh air. Restore/support breathing as necessary. Seek medical attention.

Notes to Physician: Respiratory disorders may be aggravated by exposure to metallic and/or organic/inorganic coating dusts or fumes. If steel contains lead consult OSHA Lead Standard 1910.1025.

10. SPECIAL PRECAUTIONS

None

11. S.A.R.A. Information

Manganese, Vanadium, Copper, and Zinc compounds in this product are subject to the reporting requirements of section 313 of the Title III of the S.A.R.A. Act of 1986 and CFR 40 372.

12. Ecological Information

No ecological concerns identified.

14. Disposal Considerations

Dispose of waste in accordance with federal, state, provincial, and local regulations. Material can be disposed of in a regular manner.

14. Transportation Information

No special transportation classifications

15. Regulatory Information

WHIMMS Classification (Canada):

Not classified, labeling required summarizing handling requirements.

OSHA Status:

This product may contain compounds whose exposures are regulated under the Department of Labor Occupational Health and Safety Administrations code of federal regulations concerning general industry activities and construction activities.

US EPA Status:

This product is not listed on TSCA 8(b) inventory.

This product is not listed on the TSCA export notification 12(b) list.

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- MSDS prepared October 2002
- Re-approved May 2008
- Update company name September 2008



MATERIAL SAFETY DATA SHEET
Flat Rolled Steel, Zinc Coated – All Grades

PRODUCT AND COMPANY IDENTIFICATION

Product Identifier Flat Rolled Steel, Zinc Coated – All Grades

Company Identity

Name: Severstal North America, Inc.
Address: 14661 Rotunda Drive
Dearborn, MI 48120-1699
Telephone: (313) 845-3217

Emergency Telephone Number

Health Contact: (313) 714-9501 (24 hour pager)

COMPOSITION, INFORMATION OR INGREDIENTS

Flat Rolled Steel - Disclosed Composition

Chemical	CAS No.	Percent (%)	Canada IDL
Iron	7439-89-6	98	Yes
Manganese	7439-96-5	2 max.	Yes
Zinc Oxide	1314-13-2	5 max.	Yes

CAS No. = Chemical Abstracts Service Registry Number;
Canada IDL = Ingredient Disclosure List (if substance is present in greater than 1% concentration disclosure is required)

HAZARD IDENTIFICATION

POTENTIAL HEALTH EFFECTS: Flat rolled steel products in their usual physical form do not pose a health hazard. Inhalation of metal dust, mist or fume may result from further processing of the material by the user, particularly during heating, burning, cutting, grinding, machining, welding and brazing activities and should be evaluated by an industrial hygienist. The hazard statements below refer to prolonged and repeated exposure to fumes or dusts generated during these activities.



MATERIAL SAFETY DATA SHEET
Flat Rolled Steel, Zinc Coated – All Grades

HAZARD IDENTIFICATION (continued)

INHALATION: May be harmful by inhalation. Symptoms of exposure due to inhalation include headache, nausea, dizziness, vomiting, weakness, chills, and fever. Symptoms may be delayed. The symptoms of metal fume fever do not manifest until a few hours have passed.

CONTACT WITH EYES: May cause irritation – foreign body hazard. Seek medical attention.

SKIN CONTACT: Not anticipated to pose a significant skin hazard. However, should dermatitis develop, wash affected areas thoroughly with mild soap and water. If irritation persists, seek medical attention.

INGESTION: Not considered an ingestion hazard. However, if dust is ingested may cause abdominal pain, nausea and vomiting.

TARGET ORGANS: Respiratory system (nose, throat, lungs). Central nervous system, blood, and kidneys for the Manganese portions of this material. Animal tests show that manganese may cause toxic effects upon human reproduction.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: Dust and fume exposure can aggravate individuals with chronic diseases or disorders of the respiratory system.

FIRST AID MEASURES

INHALATION: If inhalation of gas/fume/vapor/dust/mist from the material is excessive (air concentration is greater than the TLV or health effects are noticed), immediately remove the affected person(s) to fresh air. Seek medical attention.

CONTACT WITH EYES: Irrigate immediately. Treat for foreign body in eye. Seek medical attention.

SKIN CONTACT: Wash hands thoroughly after handling. Shower before changing clothes.

INGESTION: Rinse mouth with water and seek medical attention.

FIRE FIGHTING MEASURES

FIRE: Steel products do not present a fire hazard under normal conditions. Irritating and/or toxic fumes and gases may be emitted upon heating of this product and create a moderate fire hazard. Molten metal may react violently with water. Molten metal can react with water to liberate flammable hydrogen gas.

EXPLOSION: Steel products do not present an explosion hazard under normal conditions. High concentrations of metallic fines may create an explosion hazard.

FIRE EXTINGUISHING MEDIA: Do Not Use Water. Use only appropriate metal fire extinguishing dry powder.

MATERIAL SAFETY DATA SHEET
Flat Rolled Steel, Zinc Coated – All Grades

FIRE FIGHTING MEASURES (cont.)

HAZARDOUS COMBUSTION PRODUCTS: Metal oxides of listed ingredients and carbon monoxide from non-metallic coatings.

SPECIAL INFORMATION: Fire fighters are to wear full protective equipment, including bunker gear and positive pressure self-contained breathing apparatus (SCBA).

ACCIDENTAL RELEASE MEASURES

Ventilate the area of accidental release. Wear appropriate personal protective equipment and avoid generating dusty conditions. Place reclaimed product in a suitable clean, dry container. Excess product can be recycled for further use.

HANDLING AND STORAGE

HANDLING: In case of insufficient ventilation, wear suitable respiratory equipment. Do not breathe fumes or dust from this material. Avoid breathing fumes if this product is used at high temperatures. Wash thoroughly after handling. Use this product with adequate ventilation. Minimize dust generation and accumulation.

STORAGE: Store in a dry area to avoid oxidation.

EXPOSURE CONTROLS AND PERSONAL PROTECTION

Exposure Limits USA

Canada

Chemical	CAS No.	TWA			C or STEL (a)		IDLH	Cancer Class (b)	OEL Ontario
		OSHA PEL/ MIOSHA TWA	ACGIH TLV	NIOSH REL		TWAEV			
Iron	7439-89-6	10 mg/m ³ (Iron Oxide Fume as Fe)	5 mg/m ³ (Iron Oxide Fume as Fe)	5 mg/m ³ (Iron Oxide fume as Fe)	NA	NA	2500 mg/m ³ (as Fe)	NC	5 mg/m ³ (Iron Oxide Resp)
Manganese	7439-96-5	1 mg/m ³ (fume)	0.2 mg/m ³ (Fume as Mn)	1 mg/m ³	C 5 mg/m ³ (O)	STEL 3 mg/m ³ (N,O)	500 mg/m ³	NC	0.2 mg/m ³
Zinc Oxide	1314-13-2	5 mg/m ³ (fume), 5 mg/m ³ (resp dust), 15 mg/m ³ (total dust) 10 mg/m ³ (total dust – MIOSHA)	5 mg/m ³ (fume), 10 mg/m ³ (dust)	5 mg/m ³ (dust), 5 mg/m ³ (fume)	C 15 mg/m ³ (dust) (N)	STEL 10 mg/m ³ (fume) (A,N)	500 mg/m ³	NC	2 mg/m ³ (resp) 10 mg/m ³ (STEL)

CAS No. = Chemical Abstracts Service Registry Number; TWA = Time Weighted Average; PEL = Permissible Exposure Limit; TLV = Threshold Limit Value; REL = Recommended Exposure Level; C = Ceiling; STEL = Short Term Exposure Limit; IDLH = Immediately Dangerous to Life and Health; NL = Not Listed; OEL = Canadian Occupational Exposure Limit; TWAEV = Time Weighted Average Exposure Value; STEL = Short Term Exposure Limit;

(a) OSHA/ MIOSHA = O, ACGIH = A, NIOSH = N;

(b) NTP, OSHA/ MIOSHA, ACGIH, NC – Not Classifiable as a human carcinogen



MATERIAL SAFETY DATA SHEET
Flat Rolled Steel, Zinc Coated – All Grades

EXPOSURE CONTROLS AND PERSONAL PROTECTION (cont.)

ENGINEERING CONTROLS:

VENTILATION: Localized mechanical exhaust ventilation recommended when grinding, cutting, welding, burning or brazing.

PERSONAL PROTECTION:

RESPIRATORY PROTECTION: Use a dust/mist/fume particulate filter respirator for concentrations exceeding the applicable TLVs, OELs or PELs.

EYE PROTECTION: Wear goggles, protective eyewear or full-face shield.

SKIN PROTECTION: Use of an impervious apron, protective coveralls and long sleeves is recommended. Wear thermal gloves.

PHYSICAL AND CHEMICAL PROPERTIES

Material type: Solid

Parameter	Value
Appearance	Solid Metallic
Odor	None
Boiling Point	NA
Melting Point	NA
Vapor Pressure	NA
Solubility in Water	NA
Specific Gravity	8
Density	NA

NA=Not available or Not Applicable.

Parameter	Value
Freezing Point	NA
Percent Volatile (by water)	NA
Evaporation Rate	NA
PH	NA
Flash Point	Non-flammable solid
Lower Flammable Limit	NA
Upper Flammable Limit	NA
Autoignition temperature	NA

STABILITY AND REACTIVITY DATA

CHEMICAL STABILITY: This material is stable in dry air under normal temperature and pressure but will oxidize in moist air.

INCOMPATIBILITY: Manganese will react with water to produce hydrogen. Zinc oxide will react violently with aluminum and magnesium powders, and with chlorinated rubber on heating causing fire and explosion hazards.

HAZARDOUS DECOMPOSITION PRODUCTS: Metal oxides of listed ingredients and carbon monoxide from nonmetallic coatings.



MATERIAL SAFETY DATA SHEET
Flat Rolled Steel, Zinc Coated – All Grades

STABILITY AND REACTIVITY DATA (continued)

HAZARDOUS POLYMERIZATION: Will not occur

CONDITIONS TO AVOID: Acids, incompatible materials, moisture, excess heat, dust generation.

TOXICOLOGICAL INFORMATION

No information is available for the product as a mixture. Some ingredients of this material have been evaluated to determine toxicity. Acute toxicity information from RTECS is as follows:

Chemical	Organism	Test Type	Route	Reported Dose
Iron (7439-89-6)	Guinea Pig	LD50	Oral	20 gm/kg
	Rat	LD50	Oral	30 gm/kg
Manganese (7439-96-5)	Rat	LD50	Oral	9 gm/kg
Zinc Oxide (1314-13-2)	Mouse	LC50	Inhalation	2500 mg/m ³
	Mouse	LD50	Oral	7950 mg/kg
	Rat	LD50	Intraperitoneal	240 mg/kg

Long-term excessive inhalation of iron oxide fume or dust has been associated with a benign lung condition known as siderosis. No physical impairment of lung function has been linked to siderosis.

ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION: NA

CHEMICAL FATE INFORMATION: NA – Exposure to moist air may develop oxidation

DISPOSAL CONSIDERATIONS

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste facility. State and local disposal regulations may differ from federal regulations. Dispose of container and unused contents in accordance with federal, state, and local requirements.

TRANSPORTATION INFORMATION

NOT REGULATED AS U.S. DOT HAZARDOUS MATERIAL OR CANADIAN DANGEROUS GOODS



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REGULATORY INFORMATION

U. S. REGULATIONS

This material contains a toxic chemical or chemicals subject to CERCLA emergency release reporting under 40 CFR 304.

7439-96-5	Manganese Compounds
1314-13-2	Zinc Compounds

This material contains a toxic chemical or chemicals subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.

7439-96-5	Manganese (as Manganese and Manganese Compounds)
1314-13-2	Zinc Oxide (as Zinc Compounds)

SARA 311/312 Hazard Category, 40 CFR Part 370: Delayed (chronic) health hazard

RCRA, 40 CFR Part 261: Steel scrap is not regulated as a hazardous waste under RCRA.

INTERNATIONAL REGULATIONS

This product contains a toxic chemical or chemicals that are present on the Canadian Ingredient Disclosure List.

7439-89-6	Iron
7439-96-5	Manganese
1314-13-2	Zinc Oxide

CANADIAN WHMIS:

This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (Canada CPR) and the MSDS contains all of the information required by the CPR.

HMIS

Fire Hazard	0
Health Hazard	0
Reactivity	0

Safety Glasses, Gloves, Dust, Mist, Fume and Vapor Respirator

NFPA

Fire Hazard	0
Health Hazard	0
Reactivity	0

Safety Glasses, Gloves, Dust, Mist, Fume and Vapor Respirator