

Non-Galvanized and Galvanized Steel Wire and Wire Products (All Grades)

Safety Data Sheet

Revision date: 5/2/2013

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product name.	: Non-Galvanized and Galvanized Steel Wire and Wire Products (All Grades)		
Other means of identification	: Bezinal ® Wire	Barbed Wire	Dramix ® (Loose & Glued)
	Spring Wire	Shape Wire	Strand & Flooded Strand
	Galvanized Wire	Field Fence	Low/High Carbon Wire
	Welded Mes	Industrial Steel Wire	Plastic Coated Wire
	Oil Tempered Wire	Armapipe ®	Music Wire
	Chrome/Silicon Wire	Wire Rope	Standard Alloy Carbon Steel Wire

1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture : Manufacturing

1.3. Details of the supplier of the safety data sheet

Corporate Address:
1395 South Marietta Parkway
Bldg. 500, Suite 100 Marietta, GA 30067
T 770-514-2267

Plant Address:
1881 Bekaert Drive
Van Buren, AR 72956-6801
T 479-474-5211

1.4. Emergency telephone number

No additional information available

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Note: Steel products in their solid state under normal conditions, do not present an inhalation, ingestion or skin hazard. However, operations resulting in fume or particulate formation such as welding, sawing, brazing, grinding, and machining may present health hazards. Molten steel also is hazardous. The following classification is applicable in these cases.

GHS-US classification

Comb. Dust	H232
Acute Tox. 4 (Oral)	H302
Skin Sens. 1	H317
Carc. 1B	H350

2.2. Label elements

GHS-US labelling

Hazard pictograms (GHS-US) :



GHS07

GHS08

Signal word (GHS-US) : Danger

Hazard statements (GHS-US) : H232 - May form combustible dust concentrations in air
H302 - Harmful if swallowed
H317 - May cause an allergic skin reaction
H350 - May cause cancer

Precautionary statements (GHS-US) : P201 - Obtain special instructions before use
P202 - Do not handle until all safety precautions have been read and understood
P261 - Avoid breathing dust/fume/gas/mist/vapours/spray
P264 - Wash ... thoroughly after handling
P270 - Do not eat, drink or smoke when using this product
P272 - Contaminated work clothing should not be allowed out of the workplace
P280 - Wear protective gloves/protective clothing/eye protection/face protection
P301+P312 - If swallowed, call a doctor if you feel unwell
P302+P352 - IF ON SKIN: Wash with plenty of soap and water
P308+P313 - IF exposed or concerned: Get medical advice/attention
P321 - Specific treatment (see ... on this label)
P330 - If swallowed, rinse mouth

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P333+P313 - If skin irritation or rash occurs: Get medical advice/attention
P362+P364 - Take off contaminated clothing and wash it before reuse
P405 - Store locked up
P501 - Dispose of contents/container to ...

2.3. Other hazards

No additional information available

2.4. Unknown acute toxicity (GHS US)

No data available

SECTION 3: Composition/information on ingredients

3.1. Substances

Not applicable

3.2. Mixture

Name	Product identifier	%	GHS-US classification
Iron	(CAS No.) 7439-89-6	> 90	Acute Tox. 4 (Oral), H302
Zinc	(CAS No.) 7440-66-6	0 - 8	Not classified
Manganese	(CAS No.) 7439-96-5	0 - 1	Not classified
Nickel	(CAS No.) 7440-02-0	0 - 0.15	Skin Sens. 1, H317 Carc. 1B, H350 STOT RE 1, H372
Lead	(CAS No.) 7439-92-1	0 - 0.1	Carc. 1B, H350

SECTION 4: First aid measures

4.1. Description of first aid measures

- First-aid measures after inhalation : Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.
- First-aid measures after skin contact : Wash with soap and water. Seek medical advice if skin irritation develops or persists.
- First-aid measures after eye contact : Flush with plenty of water for at least 15 minutes. Seek medical advice if irritation develops or persists.
- First-aid measures after ingestion : Do NOT induce vomiting. Get immediate medical attention.

4.2. Most important symptoms and effects, both acute and delayed

- Symptoms/injuries after inhalation : Dusts may cause irritation of the nose, throat, and lungs. Excessive inhalation of metallic fumes and dusts may result in metal fume fever, an influenza-like illness. It is characterized by a sweet or metallic taste in the mouth, accompanied by dryness and irritation of the throat, cough, shortness of breath, pulmonary edema, general malaise, weakness, fatigue, muscle and joint pains, blurred vision, fever and chills. Typical symptoms last from 12 to 48 hours.
- Symptoms/injuries after skin contact : Dusts or particulates may cause mechanical irritation due to abrasion. Coated steel may cause skin irritation in sensitive individuals (See section 16 for additional information). Some components in this product are capable of causing an allergic reaction, possibly resulting in burning, itching, and skin eruptions. Contact with heated material may cause thermal burns.
- Symptoms/injuries after eye contact : Dusts or particulates may cause mechanical irritation including pain, tearing, and redness. Scratching of the cornea can occur if eye is rubbed. Fumes may be irritating. Contact with the heated material may cause thermal burns.
- Symptoms/injuries after ingestion : Not expected to be acutely toxic via ingestion based on the physical and chemical properties of the product. Swallowing of excessive amounts of the dust may cause irritation, nausea, and diarrhea.

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Component Health Effects

: Iron: A benign lung condition known as siderosis can result during long-term exposure to iron oxide fumes or dusts. Iron oxide is the result of subjecting iron and alloys to high temperature in the presence of oxygen as in a welding operation.

Zinc: Subjecting zinc or alloys containing zinc to high temperatures in the presence of oxygen (such as occurs during welding) will cause the formation of zinc oxide. Exposure to zinc oxide fumes or dusts can result in a flu-like illness called metal fume fever. Early symptoms may include a sweet or metallic taste in the mouth, dryness and irritation of the throat and coughing. These symptoms may progress to shortness of breath, headaches, fever, chills, muscle aches, nausea, vomiting, weakness, fatigue and profuse sweating. The attack may last 6 to 48 hours and is more likely to occur after a period away from the job.

Manganese dust or fumes: Chronic overexposure can cause inflammation of the lung tissue, scarring of the lungs (pulmonary fibrosis), central nervous system damage, secondary Parkinson's disease and reproductive harm in males. Early symptoms may include weakness in lower extremities, sleepiness, salivation, nervousness, and apathy. In more advanced stages, severe muscular incoordination, impaired speech, spastic walking, mask-like facial expression, and uncontrollable laughter may occur. Manganese fumes have also been reported to result in metal fume fever, a flu-like syndrome with symptoms such as dizziness, chills, fever, headache, and nausea. An increased incidence of pneumonia, bronchitis, and pneumonitis has been reported in some worker populations exposed to manganese. Animal studies indicate that manganese exposure may increase susceptibility to bacterial and viral infections.

Nickel: Nickel fumes and dusts are respiratory irritants and may cause a severe pneumonitis. Skin contact with nickel and its compounds may cause an allergic dermatitis. The resulting skin rash is often referred to as "nickel itch." Nickel and its compounds may also produce eye irritation, particularly on the inner surfaces of the eyelids (i.e., the conjunctive). Animal and/or epidemiology studies have linked nickel and certain nickel compounds to an increased incidence of cancer of the lungs and nasal passages.

Possible Residual Lead Effects: Lead intoxication due to inhalation may result from chronic overexposure with symptoms of anemia, insomnia, weakness, constipation, and gastrointestinal disorders. Ingestion may cause nausea and abdominal pain. Lead can aggravate diseases of the blood and blood-forming organs, kidneys, nervous, and possibly reproductive systems. Chronic toxicity results in the potential injury to developing fetus and possible effects on reproduction. Other conditions may include depression of blood-forming activity, kidney disease, and nervous system changes.

4.3. Indication of any immediate medical attention and special treatment needed

No additional information available

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Use Class D extinguishing agents on dusts, fines, or molten metal. Use coarse water spray on chips and turnings.

Unsuitable extinguishing media : None.

5.2. Special hazards arising from the substance or mixture

Fire hazard : When heated beyond melting point, metal vapor burns in the air with a bright greenish-yellow flame to produce zinc oxide fumes.

Explosion hazard : Dust or fines dispersed in the air can be explosive. Even a minor dust cloud can explode violently. Chips, dust or fines in contact with water can generate flammable/explosive hydrogen gas. Hydrogen gas could present an explosion hazard in confined or poorly ventilated spaces. Fines and dust in contact with certain metal oxides (e.g., rust), molten metal in contact with water/moisture or other metal oxides (e.g., rust) and moisture entrapped by molten metal can be explosive.

Reactivity : None.

5.3. Advice for firefighters

Protection during firefighting : Fire fighters should wear NIOSH approved, positive pressure, self-contained breathing apparatus, and full protective clothing when appropriate. Avoid breathing metal oxide fumes, which may cause metal fume fever.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures : Avoid inhalation, eye, or skin contact of dusts.

6.1.1. For non-emergency personnel

No additional information available

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6.1.2. For emergency responders

No additional information available

6.2. Environmental precautions

Prevent entry to sewers and public waters.

6.3. Methods and material for containment and cleaning up

For containment : Keep fine dust or powder away from sources of ignition.
 Methods for cleaning up : Fine turnings and small chips should be swept or vacuumed and placed into appropriate disposable containers. Scrap should be reclaimed for recycling. Discard any product, residue, disposable container, or liner in full compliance with federal, state, and local regulations.

6.4. Reference to other sections

No additional information available

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Additional hazards when processed : If processing of these products includes operations where dust or extremely fine particulate is generated, obtain and follow National Fire Protection Association (NFPA) safety procedures and equipment guides. Cover and reseal partially empty containers. Use non-sparking handling equipment. Provide grounding and bonding where necessary to prevent accumulation of static charges during dust handling and transfer operations. Local ventilation and vacuum systems must be designed to handle explosive dusts. Dry vacuums and electrostatic precipitators must not be used. Avoid all ignition sources. Good housekeeping practices must be maintained.

Precautions for safe handling : Avoid generating dust.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Product should be kept dry. Avoid generating dust. Avoid contact with sharp edges or heated metal. PACKAGES OF THIS MATERIAL MAY CONTAIN EXTREME INTERNAL STRESSES AND STORED MECHANICAL ENERGY. USE STANDARD INDUSTRY PRACTICES AND/OR CONSULT YOUR COMPANY'S SAFETY DEPARTMENT FOR PROPER PROCEDURES FOR HANDLING, OPENING, AND CUTTING.

7.3. Specific end use(s)

Manufacturing.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Nickel (7440-02-0)		
USA ACGIH	ACGIH TWA (mg/m ³)	1.5 mg/m ³
USA OSHA	OSHA PEL (TWA) (mg/m ³)	1 mg/m ³
Lead (7439-92-1)		
USA ACGIH	ACGIH TWA (mg/m ³)	0.05 mg/m ³
USA OSHA	OSHA PEL (TWA) (mg/m ³)	50 µg/m ³
Manganese (7439-96-5)		
USA ACGIH	ACGIH TWA (mg/m ³)	0.2 mg/m ³
USA OSHA	OSHA PEL (Ceiling) (mg/m ³)	5 mg/m ³

8.2. Exposure controls

Appropriate engineering controls : Local exhaust and general ventilation must be adequate to meet exposure standards.
 Hand protection : Use impervious gloves such as neoprene, nitrile, or rubber for hand protection.
 Eye protection : Chemical goggles or safety glasses.
 Skin and body protection : Wear suitable working clothes.
 Respiratory protection : If airborne concentrations are above the applicable exposure limits, use NIOSH approved respiratory protection.
 General : Personnel who handle and work with molten metal should utilize primary protective clothing like face shields, fire resistant tapper's jackets, leggings, spats, and similar equipment to prevent burn injuries. In addition to primary protection, secondary or day-to-day work clothing that is fire resistant and sheds metal splash is recommended for use with molten metal.
 Minimize breathing oil vapors and mist from those products coated with oil. Remove oil-contaminated clothing; launder or dry-clean before reuse. Remove oil contaminated shoes and thoroughly clean and dry before reuse. Cleanse skin thoroughly after contact, before breaks and meals, and at the end of the work period. Oil coating is readily removed from skin with waterless hand cleaners followed by a thorough washing with soap and water.

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SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	: Solid
Appearance	: Steel-grey, lustrous metal.
Colour	: grey.
Odour	: No data available
Odour threshold	: No data available
pH	: No data available
Relative evaporation rate (butylacetate=1)	: No data available
Melting point	: 2800°F / 621.37 °F lead
Freezing point	: No data available
Boiling point	: No data available
Flash point	: No data available
Self ignition temperature	: No data available
Decomposition temperature	: No data available
Flammability (solid, gas)	: No data available
Vapour pressure	: No data available
Relative vapour density at 20 °C	: No data available
Relative density	: No data available
Solubility	: No data available
Log Pow	: No data available
Log Kow	: No data available
Viscosity, kinematic	: No data available
Viscosity, dynamic	: No data available
Explosive properties	: No data available
Oxidising properties	: No data available
Explosive limits	: No data available

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

None.

10.2. Chemical stability

The product is stable at normal handling- and storage conditions.

10.3. Possibility of hazardous reactions

None.

10.4. Conditions to avoid

Steel at temperatures above the melting point may liberate fumes containing oxides of iron and alloying elements. Avoid generation of airborne fume.

10.5. Incompatible materials

Reacts with strong acids to form hydrogen gas. Hydrogen peroxide will react violently in contact with lead. (Water reacts violently with molten metals).

10.6. Hazardous decomposition products

Fumes and certain noxious gases, such as CO, may be produced from welding or burning operations. Lead oxide fumes can result if temperatures exceed the melting point for lead, 621.37 °F.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity : Harmful if swallowed.

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ATE (oral)	500 mg/kg
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Nickel (7440-02-0)

LD50 oral rat	> 9000 mg/kg
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Iron (7439-89-6)	
LD50 oral rat	984 mg/kg
ATE (oral)	984 mg/kg

Manganese (7439-96-5)	
LD50 oral rat	9 g/kg
ATE (oral)	9000000 mg/kg

Skin corrosion/irritation	: Not classified
Serious eye damage/irritation	: Not classified
Respiratory or skin sensitisation	: May cause an allergic skin reaction.
Germ cell mutagenicity	: Not classified
Carcinogenicity	: May cause cancer.

Nickel (7440-02-0)	
IARC group	2B
National Toxicity Program (NTP) Status	3

Lead (7439-92-1)	
IARC group	2A
National Toxicity Program (NTP) Status	3

Reproductive toxicity	: Not classified
Specific target organ toxicity (single exposure)	: Not classified
Specific target organ toxicity (repeated exposure)	: Not classified
Aspiration hazard	: Not classified
General	: The primary component of this product is iron. Long-term exposure to iron dusts or fumes can result in a condition called siderosis, which is considered a benign pneumoconiosis. Symptoms may include chronic bronchitis, emphysema, and shortness of breath upon exertion. Penetration of iron particles in the skin or eye may cause an exogenous or ocular siderosis, which may be characterized by a red-brown pigmentation of the effected area. Ingestion overexposure to iron may affect the gastrointestinal, nervous, and hematopoietic system and the liver. Iron and steel founding, but not iron oxide, has been listed as potentially carcinogenic by IARC.

When this product is welded, fumes are generated. Welding fumes may be different in composition from the original welding product, with the chief component being ordinary oxides of the metal being welded. Chronic health effects (including cancer) have been associated with the fumes and dusts of individual component metals (see above), and welding fumes as a general category have been listed by IARC as a carcinogen (Group B). There is also limited evidence that welding fumes may cause adverse reproductive and fetal effects. Evidence is stronger where welding materials contain known reproductive toxins, e.g., lead which may be present in the coating material of this product.

Breathing fumes or dusts of this product may result in metal fume fever, which is an illness produced by inhaling metal oxides. These oxides are produced by heating various metals including manganese, zinc and iron. Prolonged exposure to manganese dusts or fumes is associated with "manganism," a Parkinson-like syndrome characterized by a variety of neurological symptoms including muscle spasms, gait disturbances, tremors, and psychoses.

SECTION 12: Ecological information

12.1. Toxicity

Nickel (7440-02-0)	
LC50 fishes 1	> 100 mg/l (Exposure time: 96 h - Species: Brachydanio rerio)
EC50 Daphnia 1	> 100 mg/l (Exposure time: 48 h - Species: Daphnia magna)
EC50 other aquatic organisms 1	0.18 mg/l (Exposure time: 72 h - Species: Pseudokirchneriella subcapitata)
LC50 fish 2	1.3 mg/l (Exposure time: 96 h - Species: Cyprinus carpio [semi-static])
EC50 Daphnia 2	1 mg/l (Exposure time: 48 h - Species: Daphnia magna [Static])
EC50 other aquatic organisms 2	0.174 - 0.311 mg/l (Exposure time: 96 h - Species: Pseudokirchneriella subcapitata [static])

Iron (7439-89-6)	
LC50 fishes 1	13.6 mg/l (Exposure time: 96 h - Species: Morone saxatilis [static])
LC50 fish 2	0.56 mg/l (Exposure time: 96 h - Species: Cyprinus carpio [semi-static])

Zinc (7440-66-6)	
LC50 fishes 1	2.16 - 3.05 mg/l (Exposure time: 96 h - Species: Pimephales promelas [flow-through])
EC50 Daphnia 1	0.139 - 0.908 mg/l (Exposure time: 48 h - Species: Daphnia magna [Static])

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Zinc (7440-66-6)	
EC50 other aquatic organisms 1	0.11 - 0.271 mg/l (Exposure time: 96 h - Species: Pseudokirchneriella subcapitata [static])
LC50 fish 2	0.211 - 0.269 mg/l (Exposure time: 96 h - Species: Pimephales promelas [semi-static])
EC50 other aquatic organisms 2	0.09 - 0.125 mg/l (Exposure time: 72 h - Species: Pseudokirchneriella subcapitata [static])

Lead (7439-92-1)	
LC50 fishes 1	0.44 mg/l (Exposure time: 96 h - Species: Cyprinus carpio [semi-static])
EC50 Daphnia 1	600 µg/l (Exposure time: 48 h - Species: water flea)
LC50 fish 2	1.17 mg/l (Exposure time: 96 h - Species: Oncorhynchus mykiss [flow-through])

12.2. Persistence and degradability

No additional information available

12.3. Bioaccumulative potential

No additional information available

12.4. Mobility in soil

No additional information available

12.5. Other adverse effects

No additional information available

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste disposal recommendations : Dispose of contents/container in accordance with local/regional/national/international regulations.

SECTION 14: Transport information

In accordance with DOT/ ADR / RID / ADNR / IMDG / ICAO / IATA

14.1. UN number

Not applicable

14.2. UN proper shipping name

Not applicable

SECTION 15: Regulatory information

15.1. US Federal regulations

Nickel (7440-02-0)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
Listed on SARA Section 313 (Specific toxic chemical listings)	
SARA Section 313 - Emission Reporting	0.1 %

Iron (7439-89-6)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	

Zinc (7440-66-6)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
Listed on SARA Section 313 (Specific toxic chemical listings)	
SARA Section 313 - Emission Reporting	1.0 % (dust or fume only)

Lead (7439-92-1)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
Listed on SARA Section 313 (Specific toxic chemical listings)	
SARA Section 313 - Emission Reporting	0.1 %

Manganese (7439-96-5)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
Listed on SARA Section 313 (Specific toxic chemical listings)	
SARA Section 313 - Emission Reporting	1.0 %

15.2. US State regulations

Nickel (7440-02-0)				
U.S. - California - Proposition 65 - Carcinogens List	U.S. - California - Proposition 65 - Developmental Toxicity	U.S. - California - Proposition 65 - Reproductive Toxicity - Female	U.S. - California - Proposition 65 - Reproductive Toxicity - Male	No significance risk level (NSRL)
Yes				

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Lead (7439-92-1)				
U.S. - California - Proposition 65 - Carcinogens List	U.S. - California - Proposition 65 - Developmental Toxicity	U.S. - California - Proposition 65 - Reproductive Toxicity - Female	U.S. - California - Proposition 65 - Reproductive Toxicity - Male	No significance risk level (NSRL)
Yes	Yes	Yes	Yes	

Nickel (7440-02-0)
U.S. - Massachusetts - Right To Know List U.S. - Minnesota - Hazardous Substance List U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - Pennsylvania - RTK (Right to Know) List

Zinc (7440-66-6)
U.S. - Massachusetts - Right To Know List U.S. - Minnesota - Chemicals of High Concern U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - Pennsylvania - RTK (Right to Know) List

Lead (7439-92-1)
U.S. - Massachusetts - Right To Know List U.S. - Minnesota - Hazardous Substance List U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - Pennsylvania - RTK (Right to Know) List

Manganese (7439-96-5)
U.S. - Massachusetts - Right To Know List U.S. - Minnesota - Hazardous Substance List U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - Pennsylvania - RTK (Right to Know) List

SECTION 16: Other information

Other information : The information contained herein is based on the data available to us and is believed to be correct. However Bekaert Corporation makes no warranty, expressed or implied regarding the accuracy of this data or the results to be obtained from the use thereof.

Full text of H-phrases: see section 16:

Acute Tox. 4 (Oral)	Acute toxicity (oral) Category 4
Carc. 1B	Carcinogenicity Category 1B
Comb. Dust	Combustible Dust
Skin Sens. 1	Skin sensitisation Category 1
STOT RE 1	Specific target organ toxicity (repeated exposure) Category 1
H302	Harmful if swallowed
H317	May cause an allergic skin reaction
H350	May cause cancer
H372	Causes damage to organs through prolonged or repeated exposure

SDS US (GHS HazCom 2012)