MATERIAL SAFETY DATA SHEET FOR LEGGETT & PLATT WIRE DIVISION PRODUCTS

Galvanize Wire

MIDWEST FASTENERS, INC
450 RICHARD STREET
MIAMISBURG, OH 45342

WELD PINS
STEP HEAD NAILS

DATE OF PREPARATION: May 1, 2010

SECTION I - COMPONENT DATA:

CHEMICAL COMPONENTS	C.A.S. NUMBER	% WT.
Primary Metals		
Iron	7439-89-6	75-99
Chromium	7440-47-3	<0.10
Nickel	7440-02-0	<0.10

SECTION I-A-COATINGS

CHEMICAL COMPONENTS	C.A.S NUMBER	% WT
Zinc	7440-66-6	1-25

SECTION II - PHYSICAL DATA

BOILING POINT (^{o}F): Not applicable (n/a)
VAPOR PRESSURE (mmHg @ $20^{o}C$): n/a
VAPOR DENSITY: (Air = 1): n/a
SOLUBILITY IN WATER: n/a
SPECIFIC GRAVITY (H_{20} = 1): Approx. 8
PERCENT VOLATILE BY VOLUME: n/a
EVAPORATIVE RATE (ETHYL ETHER = 1): n/a
pH INFORMATION: n/a

APPEARANCE AND ODOR: Silvery-grayish solid - no odor

Section III-FIRE & EXPLOSION HAZARD DATA:

FLASH POINT (*F): N/A METHOD USED: N/A

FLAMMABILITY LIMITS (%VOL);

LEL: N/A UEL: N/A

AUTO-IGNITION TEMPERATURE (*F): N/A

EXTINGUISHING MEDIA: water spray, carbon dioxide or foam

UNUSUAL FIRE AND EXPOLSION HAZARDS: May generate smoke if sustained fire in the vicinity of this product ignites the protective coating

SECTION IV-REACTIVITY DATA:

STABILITY: Stable

INCOMPATIBILITY: (materials to avoid): None

HAZARDOUS DECOMPOSITION PRODUCTS: Metal fumes and certain noxious gases such as CO may be produced during welding or burning operations

SECTION V- HEALTH HAZARD DATA:

PRIMARY ROUTE(S) OF ENTRY: Skin contact

EFFECTS OF EXPOSURE: No toxic effects would be expected from its inert solid form.

SECTION VI- SPECIAL HANDLING INFORMATION:

VENTILATION: Ventilation as needed should be provided when welding is taking place.

PROTECTIVE CLOTHING: Use appropriate clothing such as welder's aprons and gloves when welding or burning.

EYE PROTECTION: USE SHIELD AND OR GOGGLES WHEN WELDING, BURNING

OR GRINDING

SECTION VII SPECIAL PRECAUTIONS/ADDITIONAL INFORMATION:

SPILLS: N/A

WASTE DISPOSAL METHOD: N/A

SECTION IX – SPECIAL PRECAUTIONS/ADDITIONAL INFORMATION:

PRECAUTIONS FOR HANDLING AND STORAGE: None

DOT INFORMATION:

Hazardous Material Shipping Name: N/A

Hazard Class: N/A

Identification Number: N/A

WHILE THE INFORMATION AND RECOMMENDATIONS SET FORTH ON THIS DATA SHEET ARE BELIEVED TO BE ACCURATE AS OF THE PRESENT DATE, LEGGETT & PLATT WIRE DIVISION MAKES NO WARRANTY WITH RESPECT THERETO AND DISCLAIMS ALL LIABILITY FROM RELIANCE THEREON.

MATERIAL SAFETY DATA SHEET

SECTION 1. PRODUCT INFORMATION

PRODUCT: STEEL

USE: Manufacture of steel products

SUPPLIER: NATIONAL WIRE PRODUCTS, DIVISION OF ATLANTIC STEEL INDUSTRIES, INC.
8203 Fisher Road
Baltimore, MD 21222 U.S.A.

EMERGENCY TELEPHONE NO.: (410) 477-1700

SECTION 2. PREPARATION INFORMATION

PREPARED BY: Health and Safety Department TELEPHONE NO.: (410) 477-1700

DATE: January 22, 1993

REVISED: April 3, 1995

SECTION 3. HAZARDOUS INGREDIENTS

3.1 Steel

HAZARDOUS INGREDIENT	CAS NUMBER	MAXIMUM CONCENTRATION % (weight/weight)	LD_{50}/LC_{50} (Species and route)	EXPOSURE LIMITS TLV ACGIH (mg/m^3)
Iron (Fe)	7439-89-6	91-99	LD_{50} rat-oral: 30 g/kg; guinea pig-oral: 20 g/kg LC_{50} n/av	TWA: 5 (iron oxide fume, as Fe) STEL: n/av
Manganese (Mn)	7439-96-5	1.0-5.0	LD_{50} rat-oral: 9 g/kg LC_{50} n/av	TWA: 5 (dust) 1 (fume) STEL: n/av (dust) 3 (fume)
Chrome (Cr)	7440-47-3	1.0-5.0	n/av	TWA: 0.5 (as metal, CrII, CrIII); 0.05 (as CrVI) STEL: n/av

n/ap = not applicable
n/av = not available

SECTION 3. HAZARDOUS INGREDIENTS (cont'd)

HAZARDOUS INGREDIENT	CAS NUMBER	MAXIMUM CONCENTRATION % (weight/weight)	LD_{50}/LC_{50} (Species and route)	EXPOSURE LIMITS TLV ACGIH (mg/m^3)
Silicon (Si)	7440-21-3	0.5-1.5	LD_{50} rat-oral: 3160 mg/kg LC_{50} n/av	TWA: 10 STEL: n/av
Carbon (C)	7440-44-0	0.1-1.0	LD_{50} mouse-iv: 440 mg/kg LC_{50} n/av	TWA: n/av STEL: n/av
Nickel (Ni)	7440-02-0	0.1-1.0	n/av	TWA: 1 STEL: n/av
Molybdenum (Mo)	7439-98-7	0.1-1.0	n/av	TWA: 5 (soluble) 10 (insoluble) STEL: n/av
Sulphur (S)	7704-34-9	0.1-1.0	n/av	TWA: n/av STEL: n/av
Tin (Sn)	7440-31-5	0.1-1.0	n/av	TWA: 2 STEL: n/av
Phosphorous (P)	7723-14-0	0.1-1.0	n/av	TWA: 0.1 STEL: n/av
Copper (Cu)	7440-50-8	0.1-1.0	LD_{50} mouse-ip: 3500 µg/kg LC_{50} n/av	TWA: 0.2 (fume) 1 (dusts & mists, as Cu) STEL: n/av
Aluminum (Al)	7429-90-5	<0.10	n/av	TWA: 10 (dust) 5 (welding fume) STEL: n/av
Titanium (Ti)	7440-32-6	<0.10	n/av	TWA: n/av STEL: n/av
Vanadium (V)	7440-62-2	<0.10	LD_{50} rabbit-sub-cutaneous: 59 mg/kg LC_{50} n/av	TWA: 0.05 (respirable dust/fume, as V_2O_5) STEL: n/av

SECTION 3. HAZARDOUS INGREDIENTS (cont'd)

HAZARDOUS INGREDIENT	CAS NUMBER	MAXIMUM CONCENTRATION % (weight/weight)	LD_{50}/LC_{50} (Species and route)	EXPOSURE LIMITS TLV ACGIH (mg/m^3)
Boron (B)	7440-42-8	<0.10	LD_{50} rat-oral: 650 mg/kg; mouse-oral: 560 mg/kg; rabbit & guinea pig-oral: 310 mg/kg LC_{50} n/av	TWA: n/av STEL: n/av

3.2 **Coatings:** Wires can be coated with a great variety of metal or nonmetal products. See attached supplementary notes.

SECTION 4. PHYSICAL DATA

PHYSICAL STATE: Solid

ODOUR AND APPEARANCE: No odour, metallic luster

ODOUR THRESHOLD: n/ap

SPECIFIC GRAVITY: 7.86

VAPOUR PRESSURE: n/ap

VAPOUR DENSITY: n/ap

EVAPORATION RATE: n/ap

BOILING POINT: 2750°C (approx.)

FREEZING POINT: 1530°C (approx.)

pH: n/ap

COEFFICIENT OF WATER/ OIL DISTRIBUTION: n/ap

SECTION 5. FIRE OR EXPLOSION HAZARD

Not applicable

SECTION 6. REACTIVITY DATA

CONDITIONS UNDER WHICH THE PRODUCT IS CHEMICALLY UNSTABLE: Stable

NAME OF ANY SUBSTANCE OR CLASS OF SUBSTANCE WITH WHICH THE PRODUCT IS INCOMPATIBLE : Acids

CONDITIONS OF REACTIVITY: When in molten state, contact with water or ice can result in violent splashes (release of flammable hydrogen gas).

SECTION 6. REACTIVITY DATA (cont'd)

HAZARDOUS DECOMPOSITION PRODUCTS: Metal oxides of hazardous ingredients listed in Section 3, carbon monoxide

SECTION 7. TOXICOLOGICAL PROPERTIES

ROUTES OF ENTRY:

Skin contact:	Yes	Inhalation:	Yes
Skin absorption:	No	Ingestion:	No
Eye contact:	Yes		

Fumes and/or dusts may be generated from further processing of the product by the user, such as welding, burning, cutting, grinding, machining, melting, crushing, screening or handling activities.

EFFECTS OF ACUTE EXPOSURE TO PRODUCT:

Overexposure to dust or fume formed when further processing the product may be an irritant to eyes, skin and respiratory tract. An overexposure by inhalation to decomposition products may cause metal fume fever characterized by fever and chills.

EFFECTS OF CHRONIC EXPOSURE TO PRODUCT:

Iron:	Siderosis
Manganese:	May adversely affect central nervous system (CNS) and respiratory system (e.g., asthma)
Chrome:	Dermatitis, skin ulcerations, allergic reactions, respiratory symptoms (e.g., asthma), lung cancer
Silicon:	Considered a nuisance particulate
Carbon:	Eye and respiratory tract irritant
Nickel:	Allergic dermatitis ("nickel itch"), lung inflammation, asthma, cancer of the respiratory system
Molybdenum:	Weight loss, diarrhea, loss of coordination, pneumoconiosis, breathing difficulties
Sulphur:	Mucous membranes irritation
Tin:	Stannosis
Phosphorous:	Cough, bronchitis, pneumonia
Copper:	Skin and hair discoloration, metallic or sweet taste
Aluminum:	Shaver's disease (fibrotic lung)
Titanium:	Mucous membranes irritation
Vanadium:	Inflammation of respiratory passages, asthma, cardiac palpitations, gastrointestinal discomfort, renal damage, nervous depression
Boron:	Conjunctivitis

SECTION 7. TOXICOLOGICAL PROPERTIES (cont'd)

EXPOSURE LIMITS: Refer to Section 3.

IRRITANCY OF PRODUCT: n/ap

SENSITIZATION TO PRODUCT: n/ap

CARCINOGENICITY:

The National Toxicology Program (NTP) and the International Agency for Research on Cancer (IARC) list certain hexavalent chromium compounds under the category "confirmed human carcinogen" and certain nickel compounds under the category "suspected human carcinogen".

REPRODUCTIVE TOXICITY: n/av

TERATOGENICITY: n/av

MUTAGENICITY: n/av

NAME OF TOXICOLOGICALLY SYNERGISTIC PRODUCTS: n/av

SECTION 8. PREVENTIVE MEASURES

PERSONAL PROTECTIVE EQUIPMENT TO BE USED:

Eye Protection: Use safety glasses and/or other protective eyewear when exposure to eye or face hazards exists, such as flying objects, molten metal and injurious light radiation (e.g., welding and burning).

Skin Protection: Use protective gloves and/or other personal protective equipment when welding, burning or handling.

Respiratory Protection: When engineering controls are not feasible or sufficient to lower exposure levels below the applicable exposure limit, use a NIOSH-approved respirator which protects against dusts and metal fume in accordance with manufacturers' instructions and use limitations.

SPECIFIC ENGINEERING CONTROLS TO BE USED:

Avoid creating dust/fumes. General or local exhaust ventilation is recommended near source when fumes or dusts are emitted.

PROCEDURES TO BE FOLLOWED IN CASE OF LEAK OR SPILL: n/ap

WASTE DISPOSAL:

Product can be recycled for further use, disposed in an appropriately permitted waste landfill or by other methods in accordance with local, state, provincial and federal regulations.

SECTION 8. PREVENTIVE MEASURES (cont'd)

HANDLING PROCEDURES AND EQUIPMENT:

Use lifting and work devices with rated capacities and in accordance with manufacturers' instructions.

STORAGE REQUIREMENTS: n/ap

SPECIAL SHIPPING INFORMATION: n/ap

SECTION 9. FIRST AID MEASURES

SPECIFIC FIRST AID MEASURES:

Skin: Wash with mild soap and maintain good personal hygiene. Seek medical attention if conditions persist.

Eyes: Treat for foreign body in the eye. Seek medical attention.

Inhalation: For overexposure to dust/fumes, remove to fresh air. Seek medical attention if necessary.

SECTION 10. ADDITIONAL GENERAL INFORMATION

Disclaimer

The information contained in this material safety data sheet is based on information available to the Company and is believed to be accurate. Where this information is based on data developed by third parties, the Company expressly denies liability. The Company makes no warranty, expressed or implied, regarding the accuracy of this information or data or the results obtained from its use. All recommendations are made without guarantee, since the conditions of use of this product are beyond the Company's control. The Company assumes no responsibility for any damages resulting from the use of this product described herein.

Please consult National Wire Products, Division of Atlantic Steel Industries, Inc. for further information.

STEEL COATINGS

Wires can be coated with a great variety of metal or non-metal products. Concentrations used for these products are such that they do not need to be disclosed in the material safety data sheet of this product. Following is a general description of effects on health and preventive measures concerning metal and non-metal coatings.

NON-METAL COATINGS

1) Dry Lubricants

This class of coatings includes products made of lime, borates and carbonates that may irritate the skin, eyes and respiratory system. The risk of inhalation caused by the quantity of product that could remain on the steel is very small. Preventive measures for the skin and eyes must be taken.

2) Coatings and Petroleum-based Lubricants

This class of coatings includes oils of different viscosities with or without minor additive elements. These elements include:

- corrosion inhibitors (phosphate)
- emulsifiers (fatty acids)
- detergents (sulphonates)

These products may irritate the skin, eyes and respiratory system. Contact with skin is the main element concerning this class of coatings. Lighter oils, like kerosene, can affect fatty tissues and cause redness and dermatosis after prolonged contact. Heavier oils can clog up skin pores and cause an inflammation resembling acne.

Preventive measures for the skin and eyes must be taken. It is necessary to maintain a good personal hygiene, that is to wash with water and mild soap the hands and other body parts that are exposed.

METAL COATINGS

This class of coatings can present health hazards only if the welding, cutting, heating or grinding operations are not done properly.

ZINC

Certain types of wires can be zinc-coated (CAS No. 7440-66-6). The weight of the coating varies between 60 and 200 g/m^2, according to a sampling done on wires of different diameters.

Overexposure to zinc fumes generated as a result of welding, heating or cutting operations can cause an acute affection called metal fume fever. This illness presents flu-like symptoms, such as fever, chills, nausea and vomiting. Symptoms appear from 4 to 6 hours after exposure to fumes and can last from 12 to 18 hours. No case of health hazards resulting from a chronic exposure of zinc dusts or fumes has been reported.

Make sure that there is appropriate ventilation.

STEEL

RISKS

- May cause health effects during dust/fume generating activities.
- May cause respiratory system effects when dust/fumes are inhaled.
- May cause skin irritation when in prolonged contact with surface.

PRECAUTIONARY MEASURES

- Limit skin contact. Wear protective gloves.
- Avoid creating dust/fumes.
- During dust/fumes generating activities, provide mechanical ventilation or wear personal protective equipment (i.e., eye protection, protective clothing and appropriate NIOSH-approved respirator).

FIRST AID

Inhalation: For overexposure to dust/fumes, remove to fresh air.
Skin: Wash with mild soap and maintain good personal hygiene.
Eyes: Treat for foreign body in the eye.

In all cases, seek medical attention if necessary.

Refer to material safety data sheet for further information.

NATIONAL WIRE PRODUCTS, DIVISION OF ATLANTIC STEEL INDUSTRIES, INC.
8203 FISHER ROAD, BALTIMORE, MD 21222 U.S.A.

AMERICAN SUPPLIER LABEL

MIDWEST FASTENERS, INC.

Material Safety Data Sheet

Company	Issue Date	Identification
MIDWEST FASTENERS P.O. BOX 292 Dayton, OH 45449	1-1-93 Revised 1-5-99	Carbon & Alloy
Trade Name (Common Name or Synonym) Carbon, Alloy, Steels	Phone Number (937) 866-0463	
Chemical Name Steel	From Bar, Sheet, Plate, Tubing, Structurals	

I. INGREDIENTS

Material or Component	CAS Number	% Weight	Exposure Limits	
			OSHA PEL (mg/m³)	ACGIH TLV (mg/m³)
Base Metal				
Iron (Fe)	7439-89-6	Balance	10 (Fe_2O_3 Fume)	5.0 (Fe_2O_3 Fume)
Alloying Elements				
Carbon (C)	7440-44-0	0.01 - 1.5	None Listed	None Listed
Chromium (Cr)	7440-47-3	0.01 - 12	1.0 as chrome	0.5 as chrome
Copper (Cu)	7440-50-8	0.04 - 0.7	0.2 as copper; 1.0 as dust	0.2 as fume; 1.0 as dust
Lead (Pb)	7439-92-1	0.15 - 0.35	0.05 as fume & dust	0.15 as dust and fume
Manganese (Mn)	7439-96-5	0.05 - 2.0	5 as manganese	5 as dust; 1 as fume
Molybdenum (Mo)	7439-98-7	0.01 - 1.10	15 as insoluble compds	10 as insoluble compds
Nickel (Ni)	7440-02-0	0.01 - 10	1.0 as Nickel	1.0 as Nickel
Phosphorous (P)	7723-14-0	0.15 Max	0.1 as Phosphorous	0.1 as Phosphorous
Silicon (Si)	7440-21-3	0.15 - 2.20	None Listed	10 total dust
Sulfur (S)	7704-34-9	0.001 - 0.35	13 sulfur dioxide	5 sulfur dioxide
Tungsten (W)	7440-33-7	0 - 18	None Listed	5 insoluble compds
Vanadium (V)	7440-62-2	0.01 - 1.0	0.5 dust; 0.1 fume	0.05 dust and fume
Zinc (Zn) coating	1314-13-2	10 Max	5.0 as fume	5.0 as fume

NOTE: The above listing is a summary of elements used in alloying steel. Various grades of steel will contain different combinations of these elements. Trace elements may also be present in minute amounts.

II. PHYSICAL DATA

Material is (At Normal Conditions):
☐ Liquid ☒ Solid ☐ Gas ☐ Other

Appearance and Odor: Gray-Black With Metallic Lustre — Odorless

Acidity/Alkalinity		Vapor Pressure (mm Hg at 20°C)
ph = NA	Approx Melting Point 2750°F Boiling Point NA °F	Specific Gravity (H_2O = 1) — 7 Solubility in water (% by weight) — NA	N/A

III. PERSONAL PROTECTIVE EQUIPMENT

Respiratory Protection	Hands, Arms, and Body
NIOSH approved dust/mist/fume respirator should be used during welding or burning if OSHA PEL or TLV is exceeded.	Use appropriate protective clothing such as welders aprons & gloves when welding or burning. Check local codes.
Eyes and Face	**Other Clothing and Equipment**
Safety glasses should always be worn when grinding or cutting; face shields should be worn when welding or burning.	As required

IV. EMERGENCY MEDICAL PROCEDURES

Inhalation:	Remove to fresh air; if condition continues, consult physician.
Eye Contact:	Immediately flush well with running water to remove particulate; get medical attention.
Skin Contact:	If irritation develops, remove clothing and wash well with soap and water. If condition persists, seek medical attention.
Ingestion:	If significant amounts of metal are ingested, seek medical attention.

V. HEALTH/SAFETY INFORMATION

HEALTH

Steel products in the natural state do not present an inhalation, ingestion, or contact health hazard. However, operations such as welding, burning, sawing, brazing, grinding, and possibly machining, which results in elevating the temperature of the product to or above its melting point or results in the generation of airborne particulates may present hazards. The above operations should be performed in well ventilated areas. The major exposure hazard is inhalation

Effects of overexposure are as follows:

Acute: Excessive inhalation of metallic fumes and dusts may result in irritation of eyes, nose, and throat. Also high concentrations of fumes and dusts of iron-oxide, manganese, copper, zinc, & lead may result in metal fume fever. Typical symptoms consist of a metallic taste in the mouth, dryness and irritation of the throat, chills and fever, and usually last from 12 to 48 hours.

Chronic: Chronic and prolonged inhalation of high concentrations of fumes or dust of the following elements may lead to the conditions listed opposite the element:

Iron (iron-oxide) - Pulmonary effects, siderosis.

Manganese - Bronchitis, pneumonitis, lack of coordination.

Chromium - Various forms of dermatitis, inflammation and/or ulceration of upper respiratory tract, and possibly cancer of nasal passages and lungs. Based on available information, there does not appear to be any evidence that exposure to welding fume induces human cancer.

Nickel - SAME AS CHROMIUM

Copper - Pulmonary effects.

Vanadium - No reported cases of exposure to vanadium.

Molybdenum - Pain in joints, hands, knees and feet.

Tungsten - Some evidence of pulmonary involvement such as cough.

Lead - Prolonged exposures can cause behavioral changes, kidney damage, periphery neuropathy characterized by decreased hand-grip strength and adverse reproductive effects.

Zinc - None reported.

Occupational Exposure Limits

See Section I.

FIRE AND EXPLOSION

Flash Point	Auto Ignition Temperature	Flammable Limits in Air	Extinguishing Media
NA °F	NA °F	Lower NA % Upper NA %	NA

Fire and Explosion Hazards

None

Extinguishing Media Not to be Used

NA

REACTIVITY

Stability

☒ Stable ☐ Unstable

Incompatibility (Materials to Avoid)

Reacts with strong acids to form hydrogen gas.

Conditions to Avoid

Keep Area Well Ventilated

Non-ventilated areas when cutting, welding, burning, or brazing; avoid generation of airborne dusts and fumes.

Hazardous Decomposition Products

Metallic oxides.

VI. ENVIRONMENTAL

Spill or leak procedures

NA

Special Precautions: Use good housekeeping practices to prevent accumulation of dust and to keep airborne dust to a minimum.

Waste Disposal Method

Dust, etc. — follow federal, state, and local regulations regarding disposal.

VII. ADDITIONAL INFORMATION

Disclaimer

The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any representation or warranty, expressed or implied regarding the accuracy or correctness.

The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product.

ThyssenKrupp Materials Inc

MATERIAL SAFETY DATA SHEET

SECTION I. MATERIAL IDENTIFICATION

COMPANY	RE-ISSUE DATE	IDENTIFICATION NUMBER
[illegible]	[illegible]	N/A
TRADE NAME	**EMERGENCY PHONE NUMBER**	**PREPARED BY:**
Stainless Steel	[illegible]	[illegible]
CHEMICAL NAME	**FORMULA**	**DOT IDENTIFICATION NO.**
[illegible]	N/A	N/A

SECTION II. HAZARDOUS INGREDIENTS

MATERIAL OR COMPONENT BASE METAL	CAS NUMBER	% COMPOSITION BY WEIGHT	OSHA-PEL	OSHA-mg/m3 8-HR. - TWA
IRON	7439-89-6	[illegible]	IRON OXIDE FUME	10

NOT ALL OF THE ELEMENTS LISTED BELOW ARE PRESENT IN ALL ALLOYS OF STAINLESS STEEL.

ALLOYING ELEMENTS	CAS NUMBER	% COMPOSITION BY WEIGHT (1)	OSHA-PEL	OSHA-mg/m3 8-HR. - TWA
[illegible]	[illegible]	[illegible]	[illegible] CARBON	[illegible]
MANGANESE	[illegible]	[illegible]	AS MANGANESE	5
PHOSPHORUS	[illegible]	[illegible]	AS PHOSPHORUS	[illegible]
SULFUR	[illegible]	[illegible]	AS SULFUR DIOXIDE	[illegible]
SILICON	[illegible]	[illegible]	AS SILICON [illegible] FUME	[illegible]
[illegible]	[illegible]	[illegible]	[illegible] DUST FUME	[illegible]
[illegible]	[illegible]	[illegible]	AS [illegible]	[illegible]
TANTALUM	[illegible]	[illegible]	AS TANTALUM	[illegible]
NICKEL	[illegible]	[illegible]	AS NICKEL	[illegible]
CHROMIUM	[illegible]	[illegible]	SOLUBLE CHROMIC SALTS	[illegible]
[illegible]	[illegible]	[illegible]	AS [illegible]	[illegible]
TUNGSTEN	[illegible]	[illegible]	AS TUNGSTEN DUST	[illegible]
MOLYBDENUM	[illegible]	[illegible]	SOLUBLE MOLY COMPOUNDS	[illegible]
SELENIUM	[illegible]	[illegible]	AS SELENIUM	0.2
COPPER	[illegible]	[illegible]	AS COPPER DUST	[illegible]
			AS COPPER FUME	[illegible]
ALUMINUM	[illegible]	[illegible]	AS ALUMINUM	15

PEL = Permissible Exposure Limit (1) % of Alloying Material Varies with Grade of Material. Other trace elements of <.1% may be present.

SECTION III. PHYSICAL DATA

MATERIAL (At Normal Conditions)	APPEARANCE AND ODOR
SOLID	Metallic Appearance, No Odor
MELTING POINT	**SPECIFIC GRAVITY**
2400 Deg. F (1300 Deg. C)	Approx. [illegible]

SECTION IV. FIRE AND EXPLOSIVE

SPECIAL FIRE FIGHTING PROCEDURES

These Products in Their Solid State Present No Fire Or Explosive Hazard

SECTION V. REACTIVITY DATA

STABILITY	CONDITIONS TO AVOID
Stable	Be Aware Of Unsecured Loads

HAZARDOUS DECOMPOSITION PRODUCTS

Metallic Dust Or Fumes May Be Produced During Welding, Burning, Grinding And Possibly Machining. Refer To ANSI Z49.1

SECTION VI. Environmental

SPILL OR LEAK PROCEDURES	N/A
WASTE DISPOSAL METHODS	Disposal must comply with applicable Federal, State and Local disposal and discharge laws

PRODUCT
Stainless Steel

SECTION VII. HEALTH HAZARD DATA

[illegible]

EFFECTS OF OVEREXPOSURE

Acute: [illegible]

Chronic: [illegible]

Carcinogenicity: [illegible]

Reproductive: [illegible]

Teratogenicity: [illegible]

Target Organs: [illegible]

Primary Routes of Entry: [illegible]

Medical Conditions: [illegible]

Emergency and First Aid Procedures: [illegible]

Exposure Limits: [illegible]

SECTION VIII. EMERGENCY AND FIRST AID PROCEDURES

[illegible]

Skin: [illegible]

Eyes: [illegible]

Medical Conditions Aggravated by Exposure: [illegible]

SECTION IX. SPECIAL PROTECTION INFORMATION & CONTROL MEASURES

Respiratory: [illegible]

Ventilation: [illegible]

Personal: [illegible]

Protective: [illegible]

Precautions to be taken in handling and storage: [illegible]

SECTION X. OTHER INFORMATION

SARA Section 313 Toxic Chemical List, De minimis Concentrations: [illegible]

California Proposition 65: [illegible]

[illegible]

Material Safety Data Sheet

MIDWEST FASTENERS, INC
450 RICHARD STREET
MIAMISBURG, OHIO 45342

COPPER COATED
WELD PINS
STEP HEAD NAILS

Date Prepared: April 18, 2003

Section 1 - Product Identification

Product Name: Copper Coated Steel Wire

Section 2 - Hazardous Ingredients

Ingredient	CAS#	%	TWA (ACGIH) (mg/m^3)	PEL (OSHA) (mg/m^3)	Carcinogen LD50 (oral, rat)
Iron	7439-89-6	<99	5.0 (as Fe_2O_3 fume)	10.0 (as Fe_2O_3 fume)	- - -
Copper	7440-50-8	<1	1.0	1.0	- - -
			0.1 (as fume)	0.1 (as fume)	- - -
Manganese	7439-96-5	<1	1.0 (as fume)	5.0	- - -

Percentages are representative of product and may vary depending on batch composition. Due to the variance in batch composition, trace quantities of antimony, arsenic, barium, beryllium, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, and thallium may be present in amounts <1%

Section 3 - Physical/Chemical Characteristics

Noncombustible Solid	
Boiling Point	N/A
Vapor Pressure	0 mmHg (approx)
Vapor Density:	N/A
Solubility in Water	Insoluble
Appearance and Odor	Odorless solid with metallic lustre
Evaporation Rate	N/A
Specific Gravity	5.24
Melting Point	2800EF
% Volatile by Volume:	N/A

Section 4 - Fire Fighting Measures

Flash Point	N/A
Flammable Limit	N/A
Explosive Limit	N/A

Extinguishing Media
Dry Compound or Dry Powder

Fire Fighting Instructions

Firefighters should wear full protective clothing including self contained breathing apparatus.

IDLH Concentrations

Iron Oxide Dust and Fume	2,500 mg/m^3
Copper Oxide Dust, Fume or Mist	100 mg/m^3

Unusual Fire and Explosion Hazards

Spraying water on molten metal may cause an explosion. Use a dry type extinguisher. Product is non-combustible.

NFPA Rating

Health - 1, Flammability - 0, Reactivity - 0

Section 5 - Reactivity Data

Stability

Stable.

Incompatibility

Avoid contact with strong acids and strong alkalies. Avoid contact with calcium hypochlorite.

Hazardous Polymerization

Product will not undergo hazardous polymerization.

Hazardous Decomposition

Metal fumes and certain noxious gases such as CO may be produced during welding or burning operations.

Section 6 - Health Hazard Data

Health Hazards

~~Acute and Chronic: No toxic effects are expected from this inert form. Prolonged, repeated exposure to~~ fumes or dusts generated during heating, cutting, welding, or brazing may cause the following health effects: Benign pneumoconiosis with X-ray shadows indistinguishable from fibrotic pneumoconiosis (siderosis); irritation of the eyes, upper respiratory system, nose, pharynx, nasal perforation; metal fume fever, chills, muscle ache, nausea, fever, dry throat, cough, weakness, exhaustion, metallic or sweet taste, skin or hair discoloration, metallic taste, dermatitis, lung, liver, kidney damage, anemia.

Primary Routes of Overexposure:

Inhalation
Ingestion
Skin Contact

Target Organs

Respiratory System, Eyes, Skin, liver, kidneys. (Increased risk with Wilson's disease.)

Medical Conditions Aggravated by Exposure

None found.

Cancer Information

Not found to be a carcinogen. None of the product's components are listed by ACGIH, IARC, OSHA, NIOSH or NTP.

Section 7 - First Aid Procedures

Inhalation

If a person breathes large amounts of this chemical, move the exposed person to fresh air at once. If breathing has stopped, perform mouth-to-mouth resuscitation. Keep the affected person warm and at rest. Get medical attention as soon as possible.

If a person has eye or skin contact with copper dusts or mists flush the area immediately with water for a full 15 minutes. The skin should be washed with soap and water. If copper dust is swallowed seek immediate medical attention.

Section 8 - Accidental Release Measures

Spill

Sweep up spill and place in a container.

Waste Disposal

Dispose of in accordance with applicable local, state and federal laws. May be used for scrap metal.

Section 9 - Handling and Storage

Storage

Store away from strong acids and strong alkalies. If reduced to dust form keep away from oxidizers, alkalies, sodium azide, and acetylene.

Other Precautions

Avoid breathing fumes or dust.

Section 10 - Exposure Controls / Personal Protection

Eye Protection

As necessary to protect against particles from cutting, brazing, or welding operations or radiation from welding type operations.

Skin Protection

Protective Gloves. As necessary to protect against heat or skin abrasions.

Respiratory Protection

Avoid breathing fumes or dust. A NIOSH approved dust or fume cartridge respirator is advised if airborne dust or fume levels are present and exceed PEL.

Up to 50 mg/m^3: (APF = 10) Any dust, mist, and fume respirator/(APF = 10) Any supplied-air respirator Up to 125 mg/m^3: (APF = 25) Any supplied-air respirator operated in a continuous-flow mode/(APF = 25) Any powered, air-purifying respirator with a dust, mist, and fume filterUp to 250 mg/m^3: (APF = 50) Any air-purifying, full-facepiece respirator with a high-efficiency particulate filter/(APF = 50) Any supplied-air respirator that has a tight-fitting facepiece and is operated in a continuous-flow mode/(APF = 50) Any powered, air-purifying respirator with a tight-fitting facepiece and a high-efficiency particulate filter/(APF = 50) Any self-contained breathing apparatus with a full facepiece/(APF = 50) Any supplied-air respirator with a full facepiece Up to 2500 mg/m^3: (APF = 1000) Any supplied-air respirator operated in a pressure-demand or other positive-pressure mode. Emergency or planned entry into unknown concentrations or IDLH conditions: (APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode/(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatusEscape: (APF = 50) Any air-purifying, full-facepiece respirator with a high-efficiency particulate filter/Any appropriate escape-type, self-contained breathing apparatus .

Ventilation

Provide adequate ventilation if material is exposed to heating, cutting, welding, or brazing.

Exposure Guidelines

COMPONENT		
Iron oxide fume	(1309-37-1)	5.0 mg/m^3
Copper fume	(1317-38-0)	0.1 mg/m^3
Copper dust	(7440-50-8)	1.0 mg/m^3
Manganese as fume	(7439-96-5)	1.0 mg/m^3

ThyssenKrupp Materials Inc.

MATERIAL SAFETY DATA SHEET

SECTION I. MATERIAL IDENTIFICATION

COMPANY [illegible] [illegible] [illegible] [illegible]	RE-ISSUE DATE [illegible]	IDENTIFICATION NUMBER N/A
TRADE NAME Aluminum Alloys	EMERGENCY PHONE NUMBER [illegible] 367 5282	PREPARED BY. J. Switaj
CHEMICAL NAME Aluminum [illegible] Commercial [illegible] Alloys	FORMULA AL	DOT IDENTIFICATION NO. N/A

SECTION II. HAZARDOUS INGREDIENTS

MATERIAL OR COMPONENT BASE METAL	CAS NUMBER	% COMPOSITION BY WEIGHT	PHYSICAL DESCRIPTION	OSHA mg/m3 PEL - TWA	ACGIH mg/m3 TLV - TWA	WISHA PEL mg/m3
[illegible]	[illegible]	[illegible]	[illegible] DUST	[illegible]		[illegible]

NOT ALL OF THE ELEMENTS LISTED BELOW ARE PRESENT IN ALL ALLOYS OF ALUMINUM

ALLOYING ELEMENTS	CAS NUMBER	% COMPOSITION BY WEIGHT (1)	PHYSICAL DESCRIPTION	OSHA mg/m3 PEL - TWA	ACGIH mg/m3 TLV - TWA	WISHA PEL mg/m3
[illegible]	[illegible]	[illegible]	[illegible]	2	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible] FUME	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible] DUST	[illegible]	[illegible]	
			[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible] OXIDE FUME	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible] FUME		[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
			[illegible]	[illegible]		[illegible]
[illegible]	[illegible]	[illegible]	[illegible] METAL [illegible] FUME			[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible] FUME	[illegible]	[illegible]	[illegible]
			[illegible]	[illegible]	[illegible]	[illegible]

[illegible]

[illegible]

SECTION III. PHYSICAL DATA

MATERIAL (At Normal Conditions) SOLID	APPEARANCE AND ODOR Metallic appearance; No Odor
MELTING POINT [illegible] 1215 Deg. F	SPECIFIC GRAVITY 2.5-2.9

SECTION IV. FIRE AND EXPLOSIVE

SPECIAL FIRE FIGHTING PROCEDURES: Damp aluminum dust with hydrogen may form explosive air mixtures.
Aluminum Products In Their Solid State Present No Fire Or Explosive Hazard

SECTION V. REACTIVITY DATA

STABILITY Stable	CONDITIONS TO AVOID Contact with Halogen Acids, Sodium Hydroxide Anhydrous Bromine, Iodates, and Ammonium Nitrates

HAZARDOUS DECOMPOSITION PRODUCTS
Metallic Dust Or Fumes May Be Produced During Welding, Burning, Grinding And Possibly Machining. Refer To ANSI Z49.1

SECTION VI. Environmental

SPILL OR LEAK PROCEDURES N/A
WASTE DISPOSAL METHODS Disposal must comply with applicable Federal, State and Local disposal and discharge laws.

PRODUCT

SECTION VII. HEALTH HAZARD DATA

NOTE

EFFECTS OF OVEREXPOSURE

Acute

Chronic

Aluminum

Cobalt

Chromium

Copper

Iron

Lead

Manganese

Magnesium

Silicon

Silver

Tin

Zinc

SECTION VIII. EMERGENCY AND FIRST AID PROCEDURES

Inhalation

Skin

Eyes

Medical Conditions Aggravated by Exposure

SECTION IX. SPECIAL PROTECTION INFORMATION & CONTROL MEASURES

Ventilation

Respirator

Protective

Precautions to be taken in handling and storage

SECTION X. OTHER INFORMATION

SARA Section 313 Toxic Chemical List, de minimis Concentrations

California Proposition 65

MIDWEST FASTENERS, INC.

MATERIAL SAFETY DATA SHEET

SECTION I - GENERAL INFORMATION

PRODUCT NAME: MILD STEEL – WELD PINS/COPPER COATED CD STUDS

TRADE NAME: LOW CARBON STEEL

SECTION II - CHEMICAL COMPOSITION[1]

CHEMICAL COMPONENT	CAS NUMBER	WT. %	OSHA PEL[2]	ACGIH TLV[3]
Base Metal				
Iron	7439-89-6	Balance	10	5
Manganese	7439-96-5	.25-2.0	5	1
Nickel	7740-02-0	.01-1.0	1	1
Chromium	7740-47-3	.01-2.0	1	0.5
Copper	7740-58-0	.01-1.0	0.1	0.2
Trace Elements		<2.0	n/a	n/a
Metallic Coating				
Copper	7740-58-0	99.0 (min)	5.0	5.0
Trace Elements		<1.0	n/a	n/a

SECTION III - PHYSICAL DATA

Physical State	:	Solid
Boiling Point (° F)	:	Unknown
Specific Gravity	:	Unknown
Vapor Pressure	:	n/a
Percent Volatile by Wt.	:	n/a
Vapor Density (air=1)	:	n/a
Evaporation Rate	:	n/a
Solubility by Water	:	Insoluble
Ph (Paint Coating)	:	n/a
Appearance and Odor	:	Iron Nails with Copper coating: Odorless

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[1] As defined by OSHA (29CFR1910.1200) or certain state regulations.
[2] Permissible Exposure Limit – (mg/m^3) – OSHA (29CFR1910)
[3] Threshold Limit Value – (mg/m^3) – American Conference of Governmental Industrial Hygienists

MIDWEST FASTENERS, INC.

MATERIAL SAFETY DATA SHEET

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

Flash Point:	2500° F
Extinguishing Media:	Extinguish fires with CO_2, water (fog), steam, foam, or dry chemical
Special Fire Fighting Procedures:	n/a

Unusual Fire and Explosive Hazards: When this material is involved in a fire, toxic degradation products can be produces, including CO_2, CO, and oxides of nitrogen. Fire fighter should use self-contained breathing apparatus. Dense toxic smoke can be produced when this material burns.

SECTION V – REACTIVITY DATA

Stability:	Stable
Conditions to Avoid:	Open Flame
Incompatibility:	n/a
Hazardous Polymerization:	Will Not Occur

SECTION VI – HEALTH HAZARD DATA

Principle Routes of Entry: Inhalation

Medical Conditions Possibly Aggravated: Chronic diseases or disorders of the respiratory system.

Carcinogen Information: NTP[4] and IARC[5] consider chromium and certain chromium compounds to be known human carcinogens, and nickel and certain nickel compounds to be probably human carcinogens.

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[4] National Toxicology Program
[5] International Agency for Research on Cancer

EFFECTS OF OVEREXPOSURE

NOTE: Steel products in their usual physical state do not pose any health hazards. However, when subjected to welding, burning, grinding, cutting, abrasive blasting, heat treatment, pickling, or similar operations, potentially hazardous fumes or dusts may be emitted. Despite the fact that welding, burning, etc. of steel products in this particular category may produce fumes containing manganese, chromium, nickel, and copper, the air concentrations generated of these components are expected to be extremely low. Special attention should be given to the metallic coating, which could be a significant source of the fumes and dusts created during welding or similar activities. The following is a list of fumes or dusts, which may be generated from this steel product category and health effects associated with overexposure to them.

Iron (Fe)

Subjecting iron and alloys containing iron to high temperatures (such as welding) will cause the formation of iron oxide. Long-term exposure to iron oxide fumes or dusts has been associated with a benign lung condition known as siderosis, which is observable as an x-ray change. No physical impairment of lung function has been linked to siderosis.

Manganese (Mn)

Mn intoxication is usually due to the oxide or salts of Mn; elemental Mn exhibits very low toxicity. The dusts and fumes can act as minor irritants to the eyes and respiratory tract. Both acute and chronic exposures may adversely affect the central nervous system (CNS), but symptoms are more likely to occur after at least 1 or 2 years of prolonged or repeated exposures. Early symptoms may include weakness in lower extremities, sleepiness, salivation, nervousness, and apathy. In more advanced stages, severe muscular uncoordination, impaired speech, spastic walking, mask=like facial expressions and uncontrollable laughing 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.

Chromium (Cr)

The toxicity of and health hazards of chromium are heavily dependent upon its oxidation state. The elemental (as in the metals), divalent and trivalent forms are of very low toxicity. The hexevalent form (such as occurs in chromates and chronic acids) is very toxic and can produce both acute and chronic effects. Adverse effects on the skin may include ulcerations, irritative dermatitis, and allergic skin reactions. Adverse effects on the respiratory system may include bronchiospasms, edema, hypersecretion, bronchitis, irritation allergic asthmatic reactions and ulceration and perforation of the nasal septum. Respiratory

symptoms may include coughing and wheezing, shortness of breath and nasal itch. Eye irritation or inflammation can also be produces. Exposure to some hexavalent chromium compounds has been shown to be associated with an increased risk of lung cancer.

Nickel (Ni)

Ni fumes and dusts are respiratory irritants and may cause 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". Ni and its compounds may also produce eye irritation. Particularly on the inner surfaces of the eyelids (i.e. the conjunctiva). Animal and/or epidemiology studies have linked nickel and certain nickel compounds to an increased incidence of cancer of the lungs and nasal passages.

Copper (Cu)

Inhalation of Cu fume may cause irritation of the eyes and throat and a flu-like illness called metal fume fever. Signs and symptoms of metal fume fever include fever, muscle aches, nausea, chills, dry throat, cough, and weakness. Cu fume may also produce a metallic or sweet taste. Repeated or prolonged exposure to Cu fume may cause discoloration of the skin or hair.

SECTION VII – EMERGENCY AND FIRST AID PROCEDURES

Eye Contact: Not anticipated to cause any significant eye hazard.

Skin Contact: Not anticipated to cause any significant skin hazard.

EFFECTS OF OVEREXPOSURE:

Inhalation: High concentrations of fumes may cause respiratory irritation.

SECTION VIII – TOXICITY DATA

n/a

SECTION IX – SPECIAL PROTECTION INFORMATION

Protective Gloves: As required for welding

Eye Protection: Safety glasses

Other Protective Equipment: As deemed necessary for welding

Respiratory Protection: NIOSH/MSHA approved dust and fume respirator

Ventilation: Local exhaust recommended when welding

MIDWEST FASTENERS, INC.

SECTION X – SPECIAL PRECAUTIONS AND SPILL-LEAK PROCEDURES

Handling and Storage Precautions:	Nail points may be sharp
Other:	None
Steps to be Taken in Case of Spill/Leak:	n/a
Waste Disposal Methods:	Dispose of by means as to comply with all local, state and federal regulations.
Reportable Quantity:	n/a

This document has been prepared solely for the intent of compliance with the provisions of Subpart 2 of Part 1910 of Title 29 of the Code of Federal Regulations, Paragraph 1910.1200. WHILE THE INFORMATION AND RECOMMENDATIONS SET FORTH ON THIS DATA SHEET ARE BELIEVED TO BE ACCURATE AS OF THE PRESENT DATE, MIDWEST FASTENERS INC. MAKES NO WARRANTY WITH RESPECT THERETO AND DISCALIMS ALL LIABILITY FROM RELIANCE THEREON.

FOR ADDITIONAL INFORMATION REFER TO THE FOLLOWING:

ANSI Z49.1
The American Welding Society
P.O. Box 351040
Miami, FL 33135

OSHA (29CFR1910)
U.S. Department of Labor
Washington, D.C. 20210

Prepared by: Stephen B. Turner

April, 1989

KAISER ALUMINUM

Material Safety Data Sheet

Material Name: Aluminum Alloys Containing Chromium **MSDS ID: KDS-4**

* * * Section 1 - Chemical Product and Company Identification * * *

Identification Number: KDS-4
Chemical Name: Aluminum (Minimum 0.1% Chromium)
Product Use: Fabricated Parts
Synonyms: None
Manufacturer Information

Kaiser Aluminum
27422 Portola Parkway
Suite 350
Foothill Ranch, CA 92610

Emergency # CHEMTREC 1-800-424-9300

* * * Section 2 - Hazards Identification * * *

Emergency Overview

Product is solid metallic pieces. Product may form explosive dust/air mixtures if high concentration of product dust is suspended in air. Firefighters should wear full protective clothing and self contained breathing apparatus. Exposure to dust may be irritating to eyes, nose, and throat. Contact with hot metal may cause severe thermal burns. Do not touch or handle cast aluminum or heated materials before determining the temperature. Product contains chromium which is an identified carcinogen. Hot work operation such as welding, torch cutting, etc may potentially generate hexavalent chromium which has been identified as a carcinogen. See Section 15.

Potential Health Effects: Eyes

Dust, fumes or powder may irritate eye tissue.

Potential Health Effects: Skin

Dust or powder may irritate the skin. Some products may contain residual coating. Prolonged skin contact with the coating oils may result in skin sensitization (allergy) in some individuals. Do not touch or handle cast aluminum or heated materials before determining the temperature. Aluminum does not change color on heating. Contact with hot metal may cause severe thermal burns.

Potential Health Effects: Ingestion

Not a likely route of entry. Ingestion of large amounts of dusts or particulates may produce gastrointestinal disturbances including irritation, nausea, and diarrhea.

Potential Health Effects: Inhalation

Dusts of this product may cause irritation of the nose, throat, and respiratory tract.

HMIS Ratings: Health: 1 **Fire:** 1 **Reactivity:** 0 **Pers. Prot.:** Goggles, Gloves
Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe * = Chronic hazard

* * * Section 3 - Composition / Information on Ingredients * * *

CAS #	Component	Percent[1]
7429-90-5	Aluminum	80-100
	Alloying Elements:	
7440-21-3	Silicon P, W**	0.1-1, 1-5, 5-10, 10-15
7439-89-6	Iron P, W	0.1-1, 1-5
7440-66-6	Zinc P, W	0.1-1, 1-5, 5-10
7440-50-8	Copper P, W	0.1-1, 1-5, 5-10
7439-96-5	Manganese P, W	0.1-1, 1-5
7439-95-4	Magnesium P, W	0.1-1, 1-5, 5-10

[1] Where more than one range for a component is given in the "Percent" column, the range for the component includes all the individual ranges. Thus, if the column lists 0.1-1, 1-5, 5-10, the material is present in the product at a concentration between 0.1 and 10 percent.

7440-69-9	Bismuth P, W	0.1-1, 1-3
7440-31-5	Tin P, W	0.1-1.5
64771-72-8	Coating Oil	0.1-1
7440-47-3	Chromium P, W	0.1-1

Component Related Regulatory Information

This product may be regulated, have exposure limits or other information identified as the following: Iron oxide (1309-37-1), Magnesium oxide fume (1309-48-4), Zinc oxide (1314-13-2).

Component Information/Information on Non-Hazardous Components

This material is considered hazardous under 29 CFR 1910.1200 (Hazard Communication) and the Canadian Workplace Hazardous Materials Information System (WHMIS). The information in this MSDS is provided for situations where this material may be deformed creating dusts or fumes which may be potentially hazardous.

Coating Oils: Certain products may be coated with residual processing materials which comprise less than 1% of the total product. These can include 111-82-0, 112-39-0, 112-72-1, 124-10-7, 30399-84-9, 64771-72-8, and proprietary corrosion inhibitors. See Section 16 for chemical names. With the exception of 64771-72-8 there are no established or recommended exposure limits.

**(P): Prime ingot hardener aluminum.
(W): Wrought Aluminum (fabricated products).

* * * Section 4 - First Aid Measures * * *

First Aid: Eyes

Flush immediately with water for at least 15 minutes. Do not rub eyes. If irritation persists get medical attention.

First Aid: Skin

For skin contact, flush with large amounts of water. If irritation persists, get medical attention.

First Aid: Ingestion

Due to the physical nature of this material, ingestion is unlikely to occur. If ingestion of a large amount does occur, seek medical attention.

First Aid: Inhalation

If symptoms are experienced, remove source of contamination or move victim to fresh air. Call a physician if symptoms develop or persist.

* * * Section 5 - Fire Fighting Measures * * *

General Fire Hazards

High concentration of airborne dust may form explosive mixture with air. Use adequate ventilation.
Coating oils that may be present on some products can be ignited by open flames and other sources of ignition while the aluminum base product will ignite only under extreme conditions.

Hazardous Combustion Products

Decomposition of base metal product may yield metallic oxides.
Decomposition of coating oils present on some products will release carbon monoxide, carbon dioxide, and other hydrocarbon species.

Extinguishing Media

Use dry chemical, foam, carbon dioxide, water spray or water fog for oil fires.
Use dry powder, talc, or sand to extinguish metal fires.
Material in or near fires should be cooled with a water spray or fog if compatible with fire fighting techniques for the other materials involved in the fire.

Unsuitable Extinguishing Media

Do NOT use water or halogenated agents.

Fire Fighting Equipment/Instructions

Fire fighters should wear full-face, self contained breathing apparatus and impervious protective clothing. Fire fighters should avoid inhaling any combustion products. Avoid creation of dusts.

NFPA Ratings: Health: 1 Fire: 1 Reactivity: 0

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

* * * Section 6 - Accidental Release Measures * * *

Containment Procedures

Contain the discharged material. Remove sources of ignition.

Clean-Up Procedures

Shovel the material into waste container. Avoid the generation of dusts during clean-up.

Evacuation Procedures

Isolate area. Keep unnecessary personnel away.

Special Procedures

Wear appropriate personal protective equipment. See Section 8. Follow all Local, State, Federal and Provincial regulations for disposal.

* * * Section 7 - Handling and Storage * * *

Handling Procedures

Do not breathe fumes or dust from this material. Use with adequate ventilation. Keep dusts and powders of this product from heat, sparks, or open flame. Use non-sparking tools when opening or closing containers. Do not touch or handle cast aluminum or heated materials before determining the temperature. Aluminum does not change color on heating. Series 2000 and 7000 alloy ingots must be stress relieved prior to being sawed to prevent an explosion or violent cracking. Products may have sharp edges. Handle with caution and wear appropriate personal protective equipment. Dry metal properly before loading in a melting furnace. Moisture trapped in crevices and occlusions can cause a violent explosion.

Storage Procedures

Keep the container tightly closed and in a cool, well-ventilated place. Store away from incompatible materials. If dusts and powders are formed, use adequate ventilation in storage and do not handle or store dusts or powders of this product near an open flame, heat or other sources of ignition.

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

A: Component Exposure Limits

Consult local authorities for acceptable exposure limits.

Aluminum (7429-90-5)

ACGIH:	10 mg/m3 TWA (metal dust)[2]
OSHA:	15 mg/m3 TWA (total dust); 5 mg/m3 TWA (respirable fraction)
NIOSH:	10 mg/m3 TWA (total dust); 5 mg/m3 TWA (respirable fraction)
Alberta:	10 mg/m3 TWA (dust)
British Columbia:	10 mg/m3 TWA (total dust); 3 mg/m3 TWA (respirable fraction)
Manitoba:	10 mg/m3 TWA
New Brunswick:	10 mg/m3 TWA (metal dust)
NW Territories:	10 mg/m3 TWA
	20 mg/m3 STEL
Nova Scotia:	10 mg/m3 TWA (metal dust)
Nunavut:	10 mg/m3 TWA
	20 mg/m3 STEL
Ontario:	5 mg/m3 TWAEV (powder); 10 mg/m3 TWAEV (metal and oxide dust)
Quebec:	10 mg/m3 TWAEV
Saskatchewan:	10 mg/m3 TWA
	20 mg/m3 STEL

[2] The ACGIH has proposed changing the TLV for aluminum from 10 mg/m3 as total dust to 1 mg/m3 as respirable particulate matter.

Silicon (7440-21-3)

OSHA:	10 mg/m3 TWA (total dust); 5 mg/m3 TWA (respirable fraction)
NIOSH:	10 mg/m3 TWA (total dust); 5 mg/m3 TWA (respirable fraction)
Alberta:	10 mg/m3 TWA
British Columbia:	10 mg/m3 TWA (total dust); 3 mg/m3 TWA (respirable fraction)
Manitoba:	10 mg/m3 TWA (total dust containing no asbestos and <1% free silica)
New Brunswick:	10 mg/m3 TWA
NW Territories:	5 mg/m3 TWA (respirable mass); 10 mg/m3 TWA (total mass)
Nova Scotia:	10 mg/m3 TWA
Nunavut:	5 mg/m3 TWA (respirable mass); 10 mg/m3 TWA (total mass)
Ontario:	10 mg/m3 TWAEV (total dust)
Quebec:	10 mg/m3 TWAEV (total dust, containing no asbestos and less than 1% crystalline silica)
Saskatchewan:	10 mg/m3 TWA
	20 mg/m3 STEL
Yukon:	30 mppcf TWA; 10 mg/m3 TWA
	20 mg/m3 STEL

Iron (7439-89-6)

ACGIH:	5 mg/m3 TWA (respirable fraction) (related to Iron oxide (Fe2O3))
OSHA:	10 mg/m3 TWA (fume) (related to Iron oxide)
NIOSH:	5 mg/m3 TWA (dust and fume, as Fe) (related to Iron oxide)
Alberta:	5 mg/m3 TWA (dust and fume, as Fe) (related to Iron oxide)
British Columbia:	5 mg/m3 TWA (dust and fume, as Fe) (related to Iron oxide)
	10 mg/m3 STEL (fume, as Fe) (related to Iron oxide)
Manitoba:	5 mg/m3 TWA (as Fe, welding fumes, dust, total particulate) (related to Iron oxide (Fe2O3))
New Brunswick:	5 mg/m3 TWA (particulate matter containing no asbestos and < 1% crystalline silica, dust and fume, as Fe) (related to Iron oxide (Fe2O3))
NW Territories:	5 mg/m3 TWA (respirable mass); 10 mg/m3 TWA (total mass) (related to Rouge)
Nova Scotia:	5 mg/m3 TWA (respirable fraction) (related to Iron oxide (Fe2O3))
Nunavut:	5 mg/m3 TWA (respirable mass); 10 mg/m3 TWA (total mass) (related to Rouge)
Ontario:	5 mg/m3 TWAEV (dust and fume, as Fe) (related to Iron oxide)
Quebec:	5 mg/m3 TWAEV (dust and fume, as Fe) (related to Iron trioxide)
Saskatchewan:	5 mg/m3 TWA (fume, as Fe) (related to Iron oxide)
	10 mg/m3 STEL (fume, as Fe) (related to Iron oxide)
Yukon:	5 mg/m3 TWA (fume as Fe2O3) (related to Iron oxide)
	10 mg/m3 STEL (fume, as Fe2O3) (related to Iron oxide)