



Fisk Alloy Conductors

MATERIAL SAFETY DATA SHEET

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: Steel, Low Carbon Steel, Plated Low Carbon Steel, Silver Plated Low Carbon Steel
Chemical Name: Metal Alloy
Synonyms: Silver Plated Steel
Chemical Family: Steel
Formula: Not applicable - mixture
Product Use: Wiring

COMPANY ADDRESS Fisk Alloy Inc., 10 Thomas Road, P.O.Box 26, Hawthorne, NJ 07507, USA

TECHNICAL INFORMATION: 973-427-7550

2. COMPOSITION/INFORMATION ON INGREDIENTS

CAS Number	Components	% by Weight	EINECS/ ELINCS #	Symbol	R-Phrase
7439-89-6	Iron	68 – 98	231-096-4	None	None
7440-22-4	Silver	1 – 22	231-131-3	None	None
7440-02-0	Nickel	0.8 – 8	231-111-4	Xn	R 40/43
7439-96-5	Manganese	0.5 max	231-105-1	None	None
7440-44-0	Carbon	0.12 max			

In solid form, this material is not hazardous. Dust and fumes are hazardous materials.

3. HAZARDS IDENTIFICATION

Warning! EXPOSURE TO DUST OR FUMES CAN CAUSE EYE, SKIN AND RESPIRATORY SYSTEM DAMAGE. MAY CAUSE AN ALLERGIC SKIN AND/OR RESPIRATORY REACTION. CONTAINS MATERIAL WHICH MAY CAUSE CANCER. AVOID CONTACT WITH EYES, SKIN AND CLOTHING. WASH THOROUGHLY AFTER HANDLING.

HAZARD RATINGS (for dust or fume) Degree of hazard (0 = low, 4 = extreme)

Hazardous Materials Identification System (HMIS): Health: 2 Flammability: 0 Physical Hazard: None
National Fire Protection Association (NFPA): Mixture. Not rated.

HUMAN THRESHOLD RESPONSE DATA

Odor Threshold: Unknown
Irritation Threshold: Unknown
Immediately Dangerous to Life or Health (IDLH) Value(s): The IDLH for this product is not known. The IDLH for nickel and silver is 10 mg/m³.

POTENTIAL HEALTH EFFECTS

ACUTE EFFECTS

Eye: Dust or fume can cause irritation consisting of redness, swelling, and pain. May cause conjunctivitis with repeated exposures.



Fisk Alloy Conductors

MATERIAL SAFETY DATA SHEET

Skin: Material not expected to be absorbed through the skin. Contact with dust may cause mild irritation consisting of redness and/or swelling.

Inhalation: Harmful if inhaled. Inhalation of high concentrations of powder, dust, or fume may cause severe respiratory and nasal irritation, coughing, and difficulty breathing.

Ingestion: Ingestion of large amounts of dust may cause nausea, diarrhea and or stomach pain.

CHRONIC EFFECTS:

Prolonged or repeated skin contact with dust may cause more severe irritation or dermatitis. Prolonged or repeated inhalation of dust or fume may cause more severe irritation and possibly lung damage. Chronic exposure to dust or fume may also lead to the development of permanent, severe, obstructive or fibrotic lung disease characterized by coughing, wheezing, and shortness of breath. Repeated exposure may cause an allergic skin reaction consisting of itching, redness, swelling, and rash or urticaria (hives) in sensitized individuals. Prolonged or repeated inhalation of dust or fume may cause an allergic type of asthma reaction characterized by wheezing, coughing, and extreme breathing difficulty in sensitized individuals. Prolonged or repeated exposures to chromium dusts or fumes may cause perforation of the nasal septum, bloody nose and other symptoms of severe nasal irritation. Epidemiological studies in humans have shown an association between lung and nasal cancers and prolonged occupational exposures to high concentrations of nickel. Long-term exposure to silver at high concentrations can produce a condition called argyria, which is a bluish-gray pigmentation of the skin and other body tissues. This effect is not known to be associated with any toxic effects.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Exposure to dust or fume may aggravate an existing dermatitis, blood condition, asthma, emphysema, or other respiratory disease.

POTENTIAL ENVIRONMENTAL EFFECTS: None known. Product has not been tested for environmental properties.

4. FIRST AID MEASURES

EYE CONTACT: Immediately flush out fume and dust particles with large amounts of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. If eye irritation develops, call a physician at once.

SKIN CONTACT: If exposed to dust or fumes, wash skin with plenty of water. Remove contaminated clothing and shoes and launder before reuse. If skin irritation or rash develops and persists or recurs, get medical attention.

INHALATION: If symptoms of lung irritation occur (coughing, wheezing or breathing difficulty), remove from exposure area to fresh air immediately. If breathing has stopped, perform artificial respiration. Keep affected person warm and at rest. Get medical attention.

INGESTION: Not a likely route of exposure for finished metal alloy. If dust is ingested, immediately drink water to dilute. Consult a physician if symptoms develop.

NOTE TO PHYSICIANS: There is no specific antidote to the active ingredients in this product; use symptomatic treatment.

5. FIRE FIGHTING MEASURES

<u>PROPERTY</u>	<u>VALUE</u>
Explosive	No
Flammable	No
Combustible	No
Pyrophoric	No
Flash Point (°C):	Not applicable



Fisk Alloy Conductors

MATERIAL SAFETY DATA SHEET

Burning Rate of Material: Not applicable
 Lower Explosive Limit: Not applicable
 Autoignition Temperature: Not applicable
 Upper Explosive Limit: Not applicable
 Flammability Classification (Defined by 29 CFR 1910.1200): Not applicable

UNUSUAL FIRE AND EXPLOSION HAZARDS: Dust may cause an ignitable and/or an explosive atmosphere.
 EXTINGUISHING MEDIA: For localized powder fires, smother with dry sand, dry dolomite, sodium chloride or soda ash. Use fire-extinguishing media appropriate to fight surrounding fire.
 SPECIAL FIREFIGHTING PROCEDURES: None required.

6. ACCIDENTAL RELEASE MEASURES

FOR ALL TRANSPORTATION ACCIDENTS, CALL CHEMTREC AT 800-424-9300. In dust form, this product may be an explosion hazard. Remove all sources of ignition. Dust or fume may be suppressed by the use of a local exhaust system. Dispose of per guidelines under Section 13, WASTE DISPOSAL.

7. HANDLING AND STORAGE

HANDLING: Avoid dispersion of dust in air.
 STORAGE: No special requirements.
Shelf Life Limitations: None known.
Incompatible Materials for Packaging: None known.
Incompatible Materials for Storage or Transport: None known.

OTHER PRECAUTIONS: Do not shake clothing, rags or other items to remove dust. Dust should be removed by washing or HEPA vacuuming.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

CAS #	CHEMICAL NAME	ACGIH TLV	OSHA PEL	INTERNATIONAL OELS
7439-89-6	Iron	None established	None established	None established
7440-02-0	Nickel	1.5 mg/m ³ (inhalable)	1 mg/m ³	Germany, MAK = 1 mg/m ³ Canada (B.C.), Czechoslovakia, Denmark, Norway = 0.05 mg/m ³ , K1, sensitizer Poland = 0.25 mg/m ³ Ireland, Sweden, Switzerland, U.K. = 0.5 mg/m ³ Belgium, Canada (Alberta & others), Finland, Japan, Mexico, Netherlands = 1 mg/m ³ Portugal = 1.5 mg/m ³
7440-22-4	Silver	0.1 mg/m ³	0.1 mg/m ³	Germany: 0.1 mg/m ³ (inhalable)

ENGINEERING CONTROLS: Local exhaust ventilation is recommended if significant dusting occurs or fumes are generated. Otherwise, use general exhaust ventilation.

EYE / FACE PROTECTION: Use safety glasses.

SKIN PROTECTION: Wear impervious (cut-resistant) gloves and other protective clothing. If generating a dust, wash thoroughly after handling, especially before eating, drinking, or smoking.



Fisk Alloy Conductors

MATERIAL SAFETY DATA SHEET

RESPIRATORY PROTECTION: Respiratory protection not normally needed. If dusting occurs or fumes are generated above the PEL/TLV, use a NIOSH-approved half-face or full-face respirator equipped with High Efficiency Particulate (HEPA) filter cartridges.

GENERAL HYGIENE CONSIDERATIONS: Do not eat, drink, or smoke while using this product in dust form.

9. PHYSICAL AND CHEMICAL PROPERTIES

Property	Value	Property	Value
Appearance	Silver Metallic	Vapor Density (air = 1)	Not Applicable
Odor	None	Boiling Point	No Data
Molecular Weight	Not Applicable – Mixture	Melting Point	961 °C (1762 °F) silver – 1536 °C (2797 °F) iron
Physical State	Solid	Specific Gravity (g/cc)	8.0
pH	Not Applicable	Bulk Density (g/cc)	8.0
Vapor Pressure (mm Hg)	Not Applicable	Viscosity (cps)	Not Applicable
Vapor Density	Not Applicable	Decomposition Temp.	Not Applicable
Solubility in Water (20 °C)	Negligible	Evaporation Rate	Not Applicable
Volatiles, Percent by Volume	Not Applicable	Octanol/Water Partition Coefficient	Unknown

10. STABILITY AND REACTIVITY

STABILITY:

Stable under normal temperatures and pressure.

CONDITIONS TO AVOID:

Avoid contact with carbon monoxide, particularly at temperatures between 50 °C and 300 °C, to prevent formation of nickel carbonyl which is toxic and a carcinogen.

MATERIALS TO AVOID:

Acetylene, chlorine

HAZARDOUS DECOMPOSITION PRODUCTS: When heated to decomposition, may produce metal oxides and fumes. Inhalation of high concentrations of metal fumes may cause a condition known as “metal fume fever” which is characterized by flu-like symptoms.

HAZARDOUS POLYMERIZATION:

Will not occur.

11. TOXICOLOGICAL INFORMATION

POTENTIAL EXPOSURE ROUTES: For dust: ingestion, inhalation, and eye contact. For fume: inhalation and eye contact. The finished alloy metal is not hazardous.

ACUTE ANIMAL TOXICITY DATA:

	For Product	Silver	Nickel	Iron
Oral LD ₅₀	Believed to be > 5 g/kg	> 10 g/kg (mouse)	> 5 g/kg (rat)	30 g/kg (rat)
Dermal LD ₅₀	Believed to be > 2g/kg	No data	> 7.5 g/kg (rabbit subcutaneous)	No data
Inhalation LC ₅₀	Believed to be slightly toxic	No data	> 12 mg/m ³ (rat intratracheal)	No data
Irritation	Eye and respiratory irritant, sensitizer	No data	Respiratory irritant, skin sensitizer	Eye irritant



Fisk Alloy Conductors

MATERIAL SAFETY DATA SHEET

SUBCHRONIC/ CHRONIC TOXICITY: No information for product.

CARCINOGENICITY: In laboratory animal studies, chronic exposure to high concentrations of nickel has caused an increase in lung and nasal tumors. The International Agency for Research on Cancer (IARC) has classified nickel as possibly carcinogenic to humans, group 2B. The National Toxicology Program (NTP) classifies nickel as a known human carcinogen.

MUTAGENICITY: This product is not known or reported to be mutagenic. Nickel has been shown to be mutagenic in in-vitro studies.

REPRODUCTIVE, TERATOGENICITY OR DEVELOPMENTAL EFFECTS: This product is not known or reported to cause reproductive or developmental effects. Exposure of male rats to high concentrations of nickel caused testicular degeneration. However, symptoms of systemic toxicity, including severe weight loss, were also observed at the same concentrations indicating that the testicular effects were secondary to the frank toxicity. Exposure at these levels is highly unlikely under normal working conditions.

NEUROLOGICAL EFFECTS: This product is not known or reported to cause neurological effects.

INTERACTIONS WITH OTHER CHEMICALS THAT ENHANCE TOXICITY: None known or reported.

12. ECOLOGICAL INFORMATION

ECOTOXICITY: No data is available on this product. Individual constituents are as follows:

Nickel: 96 hr LC50, rainbow trout = 31.7 mg/L; 96 hr LC50, fathead minnow = 3.1 mg/L; 72 hr EC50, freshwater algae (4 species): = 0.1 mg/L; 96 hr LC50, *Daphnia* = 0.51 mg/L

13. DISPOSAL CONSIDERATIONS

If this product becomes a waste, it DOES NOT meet the criteria of a hazardous waste as defined under 40 CFR 261, in that it does not exhibit the characteristics of hazardous waste of Subpart C, nor is it listed as a hazardous waste under Subpart D. Care must be taken to prevent environmental contamination from the use of this material. The user of this material has the responsibility to dispose of unused material, residues and containers in compliance with all relevant local, state and federal laws and regulations regarding treatment, storage and disposal for hazardous and non-hazardous wastes. This product may be a candidate for metal reclamation.

14. TRANSPOT INFORMATION

	U.S. DOT	RID/ADR	IMDG	IATA	IMO	Canada TDG
Proper Shipping Name	Not regulated					
Hazard Class						
UN No.						
Packing Group						
Label						
Reportable Quantity						

15. REGULATORY INFORMATION

US FEDERAL

TSCA	The components of this product are listed on the Toxic Substance Control Act inventory.
CERLA	Nickel, R.Q.* = 100 lbs.; Silver, R.Q. = 1000 lbs. No reporting is required if diameter of the pieces of metal is equal to or exceeds 100 micrometers (0.004 inches).
SARA 313	Nickel, Silver.



Fisk Alloy Conductors

MATERIAL SAFETY DATA SHEET

SARA 313 Hazard Class	Health: For dust or fume only	Acute: Yes Chronic: Yes	Fire: None	Reactivity: None	Release of Pressure: None
SARA 302 EHS List None of the components of this product are listed.					

* R.Q. = Reportable Quality.

STATE RIGHT TO KNOW STATUS

Component	CA Prop. 65	New Jersey	Pennsylvania	Massachusetts	Michigan
Iron	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
Nickel	X	X	X	X	X
Silver	Not Listed	X	X	X	X

EUROPEAN REGULATIONS

Because this material contains nickel at > 0.1%, this material is classified as **Xn, Harmful**. However, this material in its solid form is not required to be labeled under EC regulations.

German WGK Classification: Unknown

CANADIAN REGULATIONS

- DSL LIST: The components of this product are on the DSL or are exempt from reporting under the New Substances Notification Regulations.
- IDL: Nickel and Silver.
- WHMIS: This product is considered to be a manufactured article and therefore not subject to WHMIS requirements.

16. OTHER INFORMATION

REVISION: New, December 2009

This document is based on information obtained from Olin Brass, 427 North Shamrock St. East Alton, IL 62024-1197, MSDS-B04. **EMERGENCY TELEPHONE NUMBER: 1-888-289-1911**. For additional information visit www.olinbrass.com

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