Material Safety Data Sheet

acc. to 91/155/EEC

Printing date 06/17/2003 Reviewed on 06/17/2003

* 1 Chemical Product and Company Identification

· **Product Name: COPPER WIRE, PVC INSULATED** **1019**
· **Other Designations:** Copper wire coated with polyvinyl chloride (PVC) containing colorants and stabilizers
· **Application of the substance / the preparation**
Automotive wiring
Electrical wire
· **Manufacturer/Supplier:**
Alcoa Inc.
201 Isabella Street
Pittsburgh, PA 15212-5858 USA
Health & Safety: +1-412-553-4649

Alcoa Fujikura, Ltd.
AFL Wire Products
P.O. Box 90208
Nashville, TN 37209-0208 USA
Tel: +1-615-363-6803

· **Emergency Information:** USA: Chemtrec: +1-703-527-3887 +1-800-424-9300 ALCOA: +1-412-553-4001

* 2 Composition/Data on components:

· **Description:**
This product can be considered an article unless it is processed or recycled. The hazardous components are encapsulated within the polymers and will not migrate to the surface nor be transferred to the skin through contact. However, these components can be released during processing (heating, grinding, welding, cutting, combustion, etc.) and/or if ingested.

· **CAS No:**	**Component**	
	"WIRE"	
7440-50-8	Copper	23-85%
7440-31-5	tin	0-10%
7439-92-1	Lead	<9%
	"POLYMERIC INSULATION"	
9002-86-2	Polyvinyl chloride	15-75%
	"INSULATION COLORANTS"	
1309-37-1	Iron oxide	<4%
	Lead compounds	<4%
	Chromium compounds	<4%
	Barium compounds	<4%
	Cadmium compounds	<4%
1333-86-4	Carbon black	<4%
	Antimony compounds	<1%

· **Additional information:**
Additional compounds which may be formed (during processing or recycling) are listed in Section 8.
Concentration of colorants depends on specific color of the insulation. Unless otherwise informed, the user should assume that all colorants are present.

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* 3 Hazards identification

· **EMERGENCY OVERVIEW:** Non-combustible.

· **Potential Health Effects**
The health effects listed below are not likely to occur unless processing or combustion of this product generates dusts or vapors.

If processing occurs which generates dust/fumes:
· **EYES:** Can cause irritation to the eyes.
· **SKIN:**
Can cause skin irritation.
Contact with product at elevated temperatures can result in thermal burns.
· **INHALATION:**
Can cause mild upper respiratory tract irritation.
Can cause metal fume fever.
· **INGESTION:** Material may be harmful if swallowed.
· **Chemical ingredient and possible processing hazards:**

HEALTH EFFECTS OF INGREDIENTS:

Copper dust/mists: Can cause irritation of the eyes, skin, and respiratory tract. Chronic overexposures: Can cause reduction in the number of red blood cells (anemia), skin abnormalities (pigmentation changes) and hair discoloration. Copper fume: Can cause irritation of the eyes, mucous membranes, and respiratory tract. Acute overexposures: Can cause nausea, fever, chills, shortness of breath and malaise (metal fume fever).

Lead dust or fume: Can cause irritation of eyes and upper respiratory tract. Acute overexposures: Can cause nausea and muscle cramps. Chronic overexposures: Can cause weakness in the extremities (peripheral neuropathy), abdominal cramps, gastrointestinal tract effects, kidney damage, liver damage, central nervous system damage, damage to the blood forming organs, blood cell damage and reproductive harm. Can cause reduced fertility and fetal toxicity in pregnant women. Lead (inorganic compounds): IARC/NTP: Listed as "reasonably anticipated to be a human carcinogen" by the NTP. Listed as possibly carcinogenic to humans by IARC (Group 2B)*.

Tin (dust or fume): Chronic overexposures: Can cause benign lung disease (stannosis).

Chromium dust and fumes: Can cause irritation of eye, skin and respiratory tract. Metallic chromium and trivalent chromium: Not classifiable as to their carcinogenicity to humans by IARC.

Hexavalent chromium compounds (chromium VI): Can cause irritation of eye, skin and respiratory tract. Skin contact: Can cause irritant dermatitis, allergic reactions and skin ulcers. Chronic overexposures: Can cause perforation of the nasal septum, respiratory sensitization, asthma, fluid in the lungs (pulmonary edema), lung damage, kidney damage, lung cancer, nasal cancer and cancer of the gastrointestinal tract. IARC/NTP: Listed as "known to be a human carcinogen" by the NTP. Listed as carcinogenic to humans by IARC (Group 1)*.

Cadmium dust, fumes and mist: Can cause severe irritation of respiratory tract. Acute overexposures: Can cause shortness of breath and malaise (metal fume fever), inflammation of the lung tissue and fluid in the lungs (pulmonary edema). Effects can be delayed for several hours. Chronic overexposures: Can cause lung damage, renal tube damage, placenta damage, testicular damage, liver damage, fetal malformations, reduction in the number of red blood cells (anemia), high blood pressure (hypertension), emphysema and central nervous system effects. Can accumulate in the body over time. IARC/NTP: Listed as "known to be a human carcinogen" by the NTP. Listed as carcinogenic to humans by IARC (Group 1)*. Cadmium and cadmium compounds: Associated with lung tumors, prostate tumors, kidney tumors and testicular tumors.

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Carbon black: Can cause mechanical irritation of eyes, skin and upper respiratory tract. Chronic overexposures: Can cause chronic bronchitis and lung disease. IARC/NTP: Listed as possibly carcinogenic to humans by IARC (Group 2B)*. Additional information: Studies with experimental animals (rats) by inhalation have found lung tumors and skin tumors.

Iron oxide: Chronic overexposures: Can cause benign lung disease (siderosis). Ingestion: Can cause irritation of gastrointestinal tract, bleeding, changes in the pH of the body fluids (metabolic acidosis) and liver damage.

Barium oxide: Can cause irritation of mucous membranes, skin and upper respiratory tract. Acute overexposures: Can cause benign lung disease (baritosis). Effects are reversible on cessation of exposure.

Antimony and antimony trioxide: Can cause irritation of eyes, skin, mucous membranes and upper respiratory tract. Acute overexposures: Can cause fever, chills, shortness of breath and malaise (metal fume fever). Chronic overexposures: Can cause dermatitis, ulcers in the mouth, chemical pneumonia, lung damage, liver damage and kidney damage. Ingestion: Can cause abdominal cramps, diarrhea, dizziness, abnormal heart rhythm (arrhythmia) and death. IARC/NTP: Listed as possibly carcinogenic to humans by IARC (Group 2B).

HEALTH EFFECTS OF ADDITIONAL COMPOUNDS WHICH MAY BE FORMED:

Combustion of the insulation can generate hydrogen chloride.

Hydrogen chloride: Can cause severe irritation and corrosive burns of eyes, skin and upper respiratory tract. Acute overexposures: Can cause fluid in the lungs (pulmonary edema).

· ***Description of IARC Classifications:**
Group 1: The agent is carcinogenic to humans. There is sufficient evidence that a causal relationship existed between exposure to the agent and human cancer.
Group 2B: The agent is possibly carcinogenic to human. Generally includes agents for which there is limited evidence in humans in the absence of sufficient evidence in experimental animals.
· **Hazard description:**
· **Medical conditions aggravated by exposure to the product:**
Asthma, chronic lung disease, and skin rashes.
· **Information pertaining to particular dangers for man and environment** See item 11.
· **Classification system**
The classification was made according to the latest editions of the EU-lists, and expanded upon from company and literature data.

* 4 First aid measures

· **After inhalation**
Remove to fresh air.
Check for clear airway, breathing, and presence of pulse.
Provide cardiopulmonary resuscitation for persons without pulse or respirations.
Consult a physician.
· **After skin contact**
Wash with soap and water for at least 15 minutes.
Consult a physician if irritation persists.
· **After eye contact**
Flush eyes with plenty of water or saline for at least 15 minutes.
Consult a physician.
· **After swallowing**
If swallowed, dilute by drinking large amounts of water.
Never give anything by mouth to a convulsing or unconscious person.
Do not induce vomiting.
Consult a physician immediately.

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* 5 Fire fighting measures

· **Suitable extinguishing agents**
Use Class D extinguishing agents on fines, dust or molten metal.
Otherwise, use fire fighting methods and materials that are appropriate for surrounding fire.
· **For safety reasons unsuitable extinguishing agents**

DO NOT use water in fighting fires around molten metal.

· **Special hazards caused by the material, its products of combustion or resulting gases:**
Hydrogen chloride (HCl)
· **Protective equipment:**
Fire fighters should wear NIOSH approved, positive pressure, self-contained breathing apparatus and full protective clothing when appropriate.

* 6 Accidental release measures

· **Person-related safety precautions:**

Wear protective clothing.

· **Measures for environmental protection:** No special measures required.
· **Measures for cleaning/collecting:**
Clean up using dry procedures; avoid dusting.
If molten: Contain the flow using dry sand or salt flux as a dam. Do not use shovels or hand tools to halt the flow of molten metal. Allow the spill to cool before remelting as scrap.

* 7 Handling and storage

· **Handling**
· **Information for safe handling:**
Avoid contact with eyes and skin.
Avoid generating dust.
Provide adequate ventilation if dust is formed.
· **Information about protection against explosions and fires:**

REQUIREMENTS FOR REMELTING OF SCRAP MATERIAL AND/OR INGOT

Molten metal and water can be an explosive combination. The risk is greatest when there is sufficient molten metal to entrap or seal off the water.

Water and other forms of contamination on or contained in scrap or remelt ingot are known to have caused explosions in melting operations. While the products may have minimal surface roughness and internal voids, there remains the possibility of moisture contamination or entrapment. If confined, even a few drops of water can lead to violent explosions.

During melting operations, the following minimum guidelines should be observed:
* Inspect all materials prior to furnace charging and completely remove surface contamination such as water, ice, snow, deposits of grease and oil or other surface contamination resulting from weather exposure, shipment, or storage.
* Store materials in dry, heated areas with any cracks or cavities pointed downwards.
* Preheat and dry large items such as ingot adequately before charging into a furnace containing moltenmetal. This is typically done by use of a drying oven or homogenizing furnace. The drying cycle should bring

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the metal temperature of the coldest item of the batch to 400°F (200°C) and then hold at that temperature for 6hours.

· **Storage**

· **Requirements to be met by storerooms and receptacles:** No special requirements.

· **Information about storage in one common storage facility:** Not required.

* 8 Exposure controls and personal protection

· **Additional information about design of technical systems:**
Use with adequate ventilation to meet the limits listed in Section 8.

· **Alcoa recommended Occupational Exposure Limit:**
Alcoa recommends an Occupational Exposure Limit for hexavalent chromium compounds [chromium (VI) - both soluble and insoluble forms] of 0.25 µg/m3 TWA as chromium.

· **Components with limit values that require monitoring at the workplace:**	
7440-50-8 Copper	
OSHA PEL	0.1*;1** mg/m³ *fume **dusts & mists
ACGIH TLV	0.2*, 1** mg/m³ *fume; ** dusts&mists, as Cu
7440-31-5 tin	
OSHA PEL	2 mg/m³ Metal
ACGIH TLV	2 mg/m³
7439-92-1 Lead	
OSHA PEL	as Pb: 0.05* mg/m³ 30 ug/m3 action level; Poison (29 CFR 1910.1025)
ACGIH TLV	0.05 mg/m³ as Pb; BEI
1309-37-1 Iron oxide	
OSHA PEL	10 mg/m³ as Fe
ACGIH TLV	5 mg/m³ as Fe
Lead compounds	
ACGIH TLV OSHA PEL	0.05 as Pb mg/m³ 0.05 as Pb mg/m³
Chromium compounds	
ACGIH TLV-1	0.5 mg/m³ Cr & Cr(III)
ACGIH TLV-2	0.01 mg/m³ Water insoluble Cr(VI)
ACGIH TLV-3	0.05 mg/m³ Water soluble Cr(VI)
OSHA PEL-1	0.1 (ceiling) as CrO3 mg/m³
OSHA PEL-2	0.5 mg/m³ Cr(III)

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Barium compounds	
ACGIH TLV	0.5 as Ba mg/m³ Soluble compounds
OSHA PEL	0.5 as Ba mg/m³ Soluble compounds
Cadmium compounds	
ACGIH TLV	0.01* as Cd, 0.002**as Cd mg/m³ *Total dust; **Respirable
OSHA PEL	0.005* as Cd mg/m³ *Total dust
1333-86-4 Carbon black	
OSHA PEL	3.5 mg/m³
ACGIH TLV	3.5 mg/m³
Antimony compounds	
ACGIH TLV	0.5 as Sb mg/m³
OSHA PEL	0.5 as Sb mg/m³

· **Additional Occupational Exposure Limit Values for possible hazards during processing:**

7647-01-0 Hydrogen chloride	
OSHA PEL	Short-term value: C 7 mg/m3, C 5 ppm
ACGIH TLV	Short-term value: C 2.98 mg/m3, C 2 ppm

· **Personal protective equipment**

· **General protective and hygienic measures**

Sampling to establish lead level exposure is advised where exposure to airborne particulate or fumes is possible.
Consult OSHA Lead Standard 29 CFR 1910.1025 for specific health/industrial hygiene precautions and requirements to follow when handling lead compounds.

· **Breathing equipment:**
Use suitable respiratory protection in case of insufficient ventilation.
Suitable respiratory protective device recommended:
Acid gas cartridges - hydrogen chloride
Filter NIOSH N95.
Filter NIOSH N100 - Lead

· **Protection of hands:** Wear appropriate gloves to avoid any skin injury.

· **Material of gloves** Strong gloves

· **Penetration time of glove material** Not applicable

· **Eye protection:** Safety glasses with full side shields or goggles recommended.

* 9 Physical and chemical properties:

· **General Information**

Form: Solid.
Color: Various colors
Odor: Odorless

· **Change in condition**

Melting point/Melting range: 105-140°C (221-284°F) (Polymer)
1083°C (1981°F) (Copper)
Boiling point/Boiling range: Undetermined

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· **Flash point:**	Not applicable
· **Auto igniting:**	Product is not self igniting.
· **Danger of explosion:**	Product does not present an explosion hazard.
· **Density at 20°C (68°F):**	1.12-1.75 g/cm³ 0.04-0.06 lb/in3
· **Solubility in / Miscibility with Water:**	Insoluble
· **pH-value:**	Not applicable
· **Solvent content:**	
Organic solvents:	0.0 %

* 10 Stability and reactivity

· **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
· **Materials to be avoided:**
· **Reactions:**
Reacts with strong oxidizing agents
Molten metal can react violently/explosively with water or moisture, particularly when the water is entrapped.
· **Dangerous products of decomposition:**
Hydrogen chloride (HCl)
Toxic metal compounds
· **Additional information:** Stable under normal conditions of use, storage, and transportation.

* 11 Toxicological information

· **Primary irritant effect:**
· **On the skin:** Can cause skin irritation.
· **On the eye:** Can cause irritation to the eyes.
· **Inhalation:** Can cause mild upper respiratory tract irritation.

* 12 Ecological information:

· **Additional ecological information:**
· **General notes:** Not known to be hazardous to water.

* 13 Disposal considerations

· **Product:**
· **Recommendation**
If reuse or recycling is not possible, material may be disposed of at an industrial landfill.

RCRA Status: Not federally regulated in the U.S. if disposed of "as is." Otherwise, characterize in accordance with applicable regulations (40 CFR 261 or state equivalent in the U.S.).
· **Uncleaned packagings:**
· **Recommendation:** No special measures required.

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* 14 Transport information

· **DOT regulations:**
· **Remarks:** U.S.A. DOT: Not regulated - Enter the proper freight classification. "MSDS Number," and "Product Name" on the shipping paperwork.

Canadian TDG Hazard Class & PIN: Not regulated.

· **Land transport ADR/RID (cross-border)**
· **Remarks:** Not regulated

· **Maritime transport IMDG:**
· **Marine pollutant:** No
· **Remarks:** Not regulated

· **Air transport ICAO-TI and IATA-DGR:**
· **Remarks:** Not regulated

* 15 Regulations

· **U.S. Federal Regulations:**
· **TSCA STATUS:** All components of this product are listed on the TSCA inventory.
· **CERCLA REPORTABLE QUANTITY:**
Copper, final RQ = 5000 pounds (2270 kg) (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is equal to or exceeds 0.004 inches).
Lead, final RQ = 10 pounds (4.54 kg) (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is equal to or exceeds 0.004 inches).
Lead compounds: 100 lb Reporting Threshold
Chromium compounds: 1 lb (0.454 kg) statutory RQ (no RQ is being assigned to the generic or broad class)
Cadmium compounds: 1 lb (0.454 kg) statutory RQ (no RQ is being assigned to the generic or broad class)
Antimony compounds: 1 lb (0.454 kg) statutory RQ (no RQ is being assigned to the generic or broad class)
· **SARA TITLE III:**
Section 302 Extremely Hazardous Substances:
None.
· **Section 311/312 Hazardous Categories:**
Immediate (acute), if particulates/fumes are generated during processing.
Delayed (chronic), if particulates/fumes are generated during processing.
· **Section 313 Toxic Categories:**
Copper: 1.0% de minimis concentration
Lead: 100 lb Reporting Threshold (PBT Chemical)
Lead compounds: 100 lb Reporting Threshold (Chemical Category N420, PBT Chemical)
Chromium compounds: 1.0 percent de minimis concentration (Chemical Category N090) (related to Chromium (III) Compounds)
Barium compounds: 1.0 percent de minimis concentration (does not include Barium sulfate CAS 7727-43-7, Chemical Category N040)
Cadmium compounds: 0.1 percent de minimis concentration (Chemical Category N078)
Antimony compounds: 1.0 percent de minimis concentration (Chemical Category N010)
· **OTHER INFORMATION:**
In reference to Title VI of the Clean Air Act of 1990, this material does not contain nor was it manufactured using ozone-depleting chemicals.
· **California Proposition 65:**
Lead is known to the State of California to cause reproductive toxicity.
Lead and Cadmium are known to the State of California to cause developmental toxicity.

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Lead and lead compounds are known to the State of California to cause cancer.
Cadmium compounds and Chromium, hexavalent compounds are known to the State of California to cause cancer.

· **Pennsylvania Special Hazardous Substance:**
Chromium (VI) compounds
Cadmium

* 16 Other information:

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

· **Department issuing MSDS:**
Hazardous Materials Control Committee
Preparer: Jon N. Peace, +1-412-553-2293
Alcoa Inc., 201 Isabella Street, Pittsburgh, PA 15212-5858 USA
17 JUN 03 Supersedes 26 JUL 02

· **Alcoa MS #:** 148732

· **Appendix:**
- NFPA 70, Standard for National Electrical Code (Electrical Equipment, Grounding and Bonding)
- NFPA 77, Standard for Static Electricity
- Guide to Occupational Exposure Values 2003, Compiled by the American Conference of Governmental Industrial Hygienists (ACGIH).
- Documentation of the Threshold Limit Values and Biological Exposure Indices, Sixth Edition, 1991, Compiled by the American Conference of Governmental Industrial Hygienists, Inc. (ACGIH).
- NIOSH Pocket Guide to Chemical Hazards, U.S. Department of Health and Human Services, June 1994.
- Dangerous Properties of Industrial Materials, Sax, N. Irving, Van Nostrand Reinhold Co., Inc., 1984.
- Patty's Industrial Hygiene and Toxicology: Volume II: Toxicology, 4th ed., 1994, Patty, F. A.; edited by Clayton, G. D. and Clayton, F. E.: New York: John Wiley & Sons, Inc.
- Integrated Index(R), MICROMEDEX, Inc., 2003

· **LEGEND:**

ACGIH	American Conference of Governmental Industrial Hygienists
AICS	Australian Inventory of Chemical Substances
CAS	Chemical Abstract Services
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CPR	Cardio-pulmonary Resusitation
DOT	Department of Transportation
DSL	Domestic Substances List (Canada)
EINECS	European Inventory of Existing Commercial Chemical Substances
ENCS	Japan - Existing and New Chemical Substances
EWC	European Waste Catalogue
EPA	Environmental Protective Agency
IARC	International Agency for Research on Cancer
LC	Lethal Concentration
LD	Lethal Dose
MAK	Maximum Workplace Concentration (Germany) "maximale Arbeitsplatz-Konzentration"
NDSL	Non-Domestic Substances List (Canada)
NIOSH	National Institute for Occupational Safety and Health
NTP	National Toxicology Program
OEL	Occupational Exposure Limit
OSHA	Occupational Safety and Health Administration
PIN	Product Identification Number
RCRA	Resource Conservation and Recovery Act

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SARA Superfund Amendments and Reauthorization Act
STEL Short Term Exposure Limit
TCLP Toxic Chemicals Leachate Program
TDG Transportation of Dangerous Goods
TLV Threshold Limit Value
TSCA Toxic Substances Control Act
TWA Time Weighted Average
WHMIS Workplace Hazardous Materials Information System

m meter, cm centimeter, mm millimeter, in inch,
g gram, kg kilogram, lb pound, µg microgram,
ppm parts per million, ft feet

· *** Data compared to the previous version altered.**

COPPER WIRE, PVC INSULATED

⚠ CAUTION

Hazards: Not hazardous under normal conditions of use.

If dusts/fumes are generated during recycling/processing (heating, combustion, etc.):

Dust or fumes can cause irritation of the eyes, skin and upper respiratory tract. Molten polymers can cause thermal burns.

Combustion of PVC can release hydrogen chloride. Hydrogen chloride can cause irritation of the eyes, skin and upper respiratory tract. Overexposures can result in fluid in the lungs.

Combustion can release metal dust and fumes from colorants. Acute overexposures to metal fumes may cause metal fume fever by inhalation. Chronic overexposure to metal dusts and fumes by inhalation can cause lung damage, nasal and lung cancer, kidney damage and blood, neurological or reproductive disorders.

Fines and dusts containing lead can be harmful if ingested.

WARNING: Cadmium, cadmium compounds, lead, lead compounds and chromium (hexavalent compounds) are chemicals known to the State of California to cause cancer. Lead and cadmium are chemicals known to the State of California to cause developmental/ reproductive toxicity. (Proposition 65).

Precautions: Use with adequate ventilation when processing. Avoid generating dusts. When processing, wear safety glasses and appropriate gloves to avoid eye and skin injury. Wear appropriate respiratory protection (N95, N100 for lead, acid gas cartridges for hydrogen chloride) if concentrations exceed the permissible limits.

First Aid (if dusts or fumes are generated): EYES: Flush eyes with plenty of water or saline for at least 15 minutes. Consult a physician. SKIN: Rinse with soap and water for at least 15 minutes. Consult a physician if irritation persists. INHALATION: Remove to fresh air. Check for clear airway, breathing, and presence of pulse. Provide CPR for persons without pulse or respirations. Consult a physician. INGESTION: If swallowed, dilute by drinking large amounts of water. Never give anything by mouth to a convulsing or unconscious person. Do not induce vomiting. Consult a physician immediately.

Read Alcoa Material Safety Data Sheet No. 1019 for more information about use and disposal.

Emergency Phone: (412) 553-4001

INGREDIENTS:	CAS NUMBERS:	INGREDIENTS:	CAS NUMBERS:
Copper	7440-50-8	Polyvinyl chloride (PVC)	9002-86-2
Tin	7440-31-5	Lead	7439-92-1
Colorants*	(--)		

*May contain iron oxide, carbon black, and compounds of antimony, barium, cadmium, chromium, and lead.

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