



SAFETY DATA SHEET

1. Identification

Product identifier Safety-Silv® 40Ni2, Safety-Silv® 50N, Safety-Silv® 54, Safety-Silv® 56N, AgClad™ 40Ni2, AgClad™ 50N

Other means of identification

SDS number 0011

Product type High Silver Brazing Alloys containing Cu, Ag, Zn and Ni

Recommended use Metal brazing.

Recommended restrictions None known.

Manufacturer/Importer/Supplier/Distributor information

Manufacturer/Supplier Harris Products Group
4501 Quality Place
Mason, Ohio 45040 US
custservmason@jwharris.com

Telephone number 513-754-2000

Emergency Telephone Numbers 1-888-609-1762 (US, Canada, Mexico only)
Please quote 333988

2. Hazard(s) identification

Physical hazards Not classified.

Health hazards Not classified.

OSHA defined hazards Not classified.

Label elements

Hazard symbol None.

Signal word None.

Hazard statement The mixture does not meet the criteria for classification.

Precautionary statement

Prevention Observe good industrial hygiene practices.

Response Wash hands after handling.

Storage Store away from incompatible materials.

Disposal Dispose of waste and residues in accordance with local authority requirements.

Hazard(s) not otherwise classified (HNOC) None known.

Supplemental information FUMES AND GASES developed during product melting can be hazardous to your health. HEAT RAYS, (infrared radiation) from flame or hot metal can injure eyes. Wear correct eye, ear, and body protection. Chemical flux used with the product, or flux coating on the rod, may contain fluorides or other materials that generate hazardous fumes when heated. Please refer to section 11 of this sds for further details of possible hazards during handling.

3. Composition/information on ingredients

Mixtures

Chemical name	CAS number	%
Silver	7440-22-4	40 - 56
Copper	7440-50-8	20 - 40
Zinc	7440-66-6	2 - 28
Nickel	7440-02-0	1 - 2

Flux

Chemical name	CAS number	%
Potassium fluoroborate	14075-53-7	30 - 60
Potassium tetraborate tetrahydrate	12045-78-2	0 - 40
Boric acid	10043-35-3	10 - 35
Methacrylate polymer	Proprietary	1 - 5
Water	7732-18-5	Balance

Composition comments Rods may be coated with flux containing Boric acid (CAS 10043-35-3) and Potassium fluoborate (CAS 14075-53-7). It can be reasonably assumed that on coated rods each of the flux constituents may comprise up to 30% by mass of the total mass.

All concentrations are in percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

Ag Clad 40Ni2 and 50N are composed of a a layer of a braze alloy layer clad with copper layers on either side in a 1-2-1 ratio.

4. First-aid measures

Inhalation

Remove person from contaminated area to fresh air. Apply artificial respiration if needed. Call a physician if symptoms develop or persist.

Skin contact

Remove contaminated clothes and rinse skin thoroughly with water for at least 15 minutes. Get medical attention if irritation develops and persists.

Eye contact

Rinse immediately with plenty of water for at least 15 minutes. Remove any contact lenses. Get medical attention if irritation develops or persists.

Ingestion

Do NOT induce vomiting. Immediately rinse mouth and drink a cupful of water. Never give anything by mouth to an unconscious person. Get medical attention immediately.

Most important symptoms/effects, acute and delayed

Contact may cause irritation and redness. Dust may irritate respiratory system. Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting. Typical metal fume fever begins four to twelve hours after sufficient exposure to freshly formed fumes. The first symptoms are a metallic taste, dryness and irritation of the throat. Cough and shortness of breath may occur along with headache, fatigue, nausea, vomiting, muscle and joint pain, fever and chills. The syndrome runs its course in 24-48 hours.

Indication of immediate medical attention and special treatment needed

Treat symptomatically. Symptoms may be delayed.

General information

Show this safety data sheet to the doctor in attendance.

5. Fire-fighting measures

Suitable extinguishing media

Extinguish with foam, carbon dioxide or dry powder.

Unsuitable extinguishing media

Do not use water or halogenated extinguishing media.

Specific hazards arising from the chemical

Fire or high temperatures create: Metal oxides.

Special protective equipment and precautions for firefighters

Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

Fire fighting equipment/instructions

Self-contained breathing apparatus and full protective clothing must be worn in case of fire. Move containers from fire area if you can do it without risk.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

There is no spilled material. Product has metal rods or wire form.

Methods and materials for containment and cleaning up

For waste disposal, see Section 13 of the SDS.

Environmental precautions

Avoid release to the environment.

7. Handling and storage

Precautions for safe handling

Avoid inhalation of dust and fumes. Use process enclosures, local exhaust ventilation, or other engineering controls to control sources of dust and fumes. Keep formation of airborne dusts to a minimum. Avoid contact with skin and eyes. Wear appropriate personal protective equipment (See Section 8). Do not get this material on clothing. Do not eat, drink or smoke when using the product. Wash thoroughly after handling. Avoid release to the environment.

Conditions for safe storage, including any incompatibilities

Store in tightly closed original container in a dry, cool and well-ventilated place. Store in a closed container away from incompatible materials. Keep away from food, drink and animal feedingstuffs.

8. Exposure controls/personal protection

Occupational exposure limits

US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

Components	Type	Value	Form
Copper (CAS 7440-50-8)	PEL	1 mg/m ³ 0.1 mg/m ³	Dust and mist. Fume.
Nickel (CAS 7440-02-0)	PEL	1 mg/m ³	
Silver (CAS 7440-22-4)	PEL	0.01 mg/m ³	
Decomposition	Type	Value	Form
Zinc oxide (CAS 1314-13-2)	PEL	5 mg/m ³ 5 mg/m ³ 15 mg/m ³	Fume. Respirable fraction. Total dust.
Flux	Type	Value	Form
Fluorides (CAS 16984-48-8)	PEL	2.5 mg/m ³	

US. OSHA Table Z-2 (29 CFR 1910.1000)

Flux	Type	Value	Form
Fluorides (CAS 16984-48-8)	TWA	2.5 mg/m ³	Dust.

ACGIH

Components	Type	Value	Form
Copper (CAS 7440-50-8)	TWA	1 mg/m ³ 0.2 mg/m ³	Dust and mist. Fume.

US. ACGIH Threshold Limit Values

Components	Type	Value	Form
Nickel (CAS 7440-02-0)	TWA	1.5 mg/m ³	Inhalable fraction.
Silver (CAS 7440-22-4)	TWA	0.1 mg/m ³	Dust and fume.
Decomposition	Type	Value	Form
Zinc oxide (CAS 1314-13-2)	STEL	10 mg/m ³	Respirable fraction.
	TWA	2 mg/m ³	Respirable fraction.
Flux	Type	Value	Form
Boric acid (CAS 10043-35-3)	STEL	6 mg/m ³	Inhalable fraction.
	TWA	2 mg/m ³	Inhalable fraction.
Fluorides (CAS 16984-48-8)	TWA	2.5 mg/m ³	

US. NIOSH: Pocket Guide to Chemical Hazards

Components	Type	Value	Form
Copper (CAS 7440-50-8)	TWA	1 mg/m ³	Dust and mist.
Nickel (CAS 7440-02-0)	TWA	0.015 mg/m ³	
Silver (CAS 7440-22-4)	TWA	0.01 mg/m ³	Dust.
Decomposition	Type	Value	Form
Zinc oxide (CAS 1314-13-2)	Ceiling	15 mg/m ³	Dust.
	STEL	10 mg/m ³	Fume.
	TWA	5 mg/m ³ 5 mg/m ³	Fume. Dust.

US. NIOSH: Pocket Guide to Chemical Hazards

Flux	Type	Value
Fluorides (CAS 16984-48-8)	TWA	2.5 mg/m3

Biological limit values

ACGIH Biological Exposure Indices

Flux	Value	Determinant	Specimen	Sampling Time
Fluorides (CAS 16984-48-8)	3 mg/l	Fluoride	Urine	*
	2 mg/l	Fluoride	Urine	*

* - For sampling details, please see the source document.

Exposure guidelines

No exposure standards allocated.

Appropriate engineering controls

Provide adequate ventilation. Observe occupational exposure limits and minimize the risk of inhalation of dust and fumes. Shower, hand and eye washing facilities near the workplace are recommended.

Individual protection measures, such as personal protective equipment

Eye/face protection

Wear safety glasses with side shields (or goggles). When these products are used in conjunction with brazing, it is recommended that safety glasses, goggles, or face-shield with filter lens of appropriate shade number (per ANSI Z49.1-1988, "Safety in Welding and Cutting") be worn.

Skin protection

Hand protection

Wear protective gloves (i.e. latex, nitrile, neoprene).

Other

Protective clothing is recommended. When these products are used in conjunction with brazing, wear protective clothing that protects from sparks and flame (per ANSI Z49.1-1988, "Safety in Welding and Cutting").

Respiratory protection

Use a respirator when local exhaust or ventilation is not adequate to keep exposures below the TLV. In a confined space a supplied respirator may be required. Selection and use of respiratory protective equipment should be in accordance with OSHA General Industry Standard 29 CFR 1910.134; or in Canada with CSA Standard Z94.4. Use a NIOSH/MSHA approved respirator if there is a risk of exposure to dust/fume at levels exceeding the exposure limits. In case of inadequate ventilation or risk of inhalation of dust or fumes, use suitable respiratory equipment.

Thermal hazards

Not available.

General hygiene considerations

Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

9. Physical and chemical properties

Appearance

Wire, rods, shapes, strip, bare and flux coated.

Physical state

Solid.

Form

Solid.

Color

Not available.

Odor

Odorless.

Odor threshold

Not available.

pH

Not applicable.

Melting point/freezing point

Not applicable.

Initial boiling point and boiling range

Not available.

Flash point

Not available.

Evaporation rate

Not available.

Flammability (solid, gas)

Not available.

Upper/lower flammability or explosive limits

Flammability limit - lower (%)

Not available.

Flammability limit - upper (%)

Not available.

Vapor pressure

Not applicable.

Vapor density

Not applicable.

Relative density

Not available.

Solubility(ies)	
Solubility (water)	Insoluble.
Partition coefficient (n-octanol/water)	Not available.
Auto-ignition temperature	Not available.
Decomposition temperature	Not available.
Viscosity	Not available.

10. Stability and reactivity

Reactivity	The product is stable and non-reactive under normal conditions of use, storage and transport.
Chemical stability	Material is stable under normal conditions.
Possibility of hazardous reactions	Hazardous polymerization does not occur.
Conditions to avoid	Contact with incompatible materials.
Incompatible materials	Strong oxidizing agents. Strong acids. Strong bases. Acetylene. Ammonia. Hydrogen peroxide (H ₂ O ₂). Chlorine. Bromine, iodine, turpentine, magnesium metal. Hydrogen sulfide. Ammonium nitrate.
Hazardous decomposition products	Toxic metal oxides are emitted when heated above the melting point. Products containing flux may also release boric anhydride, fluoride compounds and hydrogen fluorides. Methacrylate polymer decomposes when heated and will release flammable vapors which irritate eyes and the respiratory system. They comprise mainly n-butyl methacrylate (CAS 97-88-1).

11. Toxicological information

Information on likely routes of exposure

Inhalation	May cause respiratory irritation. Lung damage and possible pulmonary edema can result from dust exposure. Inhalation of fumes may cause a flu-like illness called metal fume fever.
Skin contact	Dust or powder may irritate the skin. May cause an allergic skin reaction. Exposure to hot material may cause thermal burns.
Eye contact	Fumes from heated material may cause eye irritation. Dust can cause eye irritation. Exposure to hot material may cause thermal burns.
Ingestion	Ingestion of this product may cause nausea, vomiting and diarrhea. Copper poisoning can result in hemolytic anemia and kidney, liver and spleen damage.

Symptoms related to the physical, chemical and toxicological characteristics

Contact may cause irritation and redness. Dust may irritate respiratory system. Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting. Typical metal fume fever begins four to twelve hours after sufficient exposure to freshly formed fumes. The first symptoms are a metallic taste, dryness and irritation of the throat. Cough and shortness of breath may occur along with headache, fatigue, nausea, vomiting, muscle and joint pain, fever and chills. The syndrome runs its course in 24-48 hours.

Information on toxicological effects

Acute toxicity	When heated, the vapors/fumes given off may cause respiratory tract irritation. High concentrations of freshly formed fumes/dusts of metal oxides can produce symptoms of metal fume fever. Exposure to extremely high levels of fluorides can cause abdominal pain, diarrhea, muscular weakness, and convulsions. In extreme cases it can cause loss of consciousness and death.
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Toxicological data

Flux	Species	Test Results
Boric acid (CAS 10043-35-3)		
Acute		
<i>Dermal</i>		
LD50	Rabbit	> 2000 mg/kg
<i>Oral</i>		
LD50	Rat	2660 mg/kg
Skin corrosion/irritation	Dust may irritate skin. Hot or molten material may produce thermal burns.	
Serious eye damage/eye irritation	Dust may irritate the eyes. Contact with hot product may cause severe burns.	
Respiratory or skin sensitization		
Respiratory sensitization	Not available.	

Skin sensitization	Prolonged or repeated contact can result in defatting and drying of the skin which may result in skin irritation and dermatitis (rash). May cause sensitization by skin contact.
Germ cell mutagenicity	No data available.
Carcinogenicity	Due to the form of the product, exposure to the potentially carcinogenic components is not expected. Dust or powder:
IARC Monographs. Overall Evaluation of Carcinogenicity	
Fluorides (CAS 16984-48-8)	3 Not classifiable as to carcinogenicity to humans.
Nickel (CAS 7440-02-0)	2B Possibly carcinogenic to humans.
NTP Report on Carcinogens	
Nickel (CAS 7440-02-0)	Known To Be Human Carcinogen. Reasonably Anticipated to be a Human Carcinogen.
OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)	
Not listed.	
Reproductive toxicity	This product is not reported to cause reproductive effects in humans. Clinical studies on test animals exposed to relatively high doses of the Boric Acid and Copper components of this product indicate adverse reproductive effects.
Specific target organ toxicity - single exposure	Not expected to be hazardous in the wire form.
Specific target organ toxicity - repeated exposure	Not expected to be hazardous in the wire form. See also "Chronic effects" for further information.
Aspiration hazard	Not likely, due to the form of the product.
Chronic effects	Ingestion of silver may cause a permanently benign bluish gray discoloration to the skin (argyria). Contains nickel, which can cause lung or nasal cancer. Long-term breathing of this material may cause chronic lung disease. Repeated exposure to fluorides may cause excessive calcification of the bone and calcification of ligaments of the ribs, pelvis and spinal column. Absorbed fluoride can cause metabolic imbalances with irregular heartbeat, nausea, dizziness, vomiting and seizures.
Further information	No other specific acute or chronic health impact noted. Ingestion of silver may cause a permanently benign bluish gray discoloration to the skin (argyria). Prolonged overexposure to fluorides may increase fluoride content of bones and teeth, and may result in fluorosis, and brittleness of bones. Absorbed fluoride can cause metabolic imbalances with irregular heartbeat, nausea, dizziness, vomiting and seizures.

12. Ecological information

Ecotoxicity Alloys in massive forms present a limited hazard for the environment.

Flux	Species	Test Results
Boric acid (CAS 10043-35-3)		
Aquatic		
Fish	LC50	Razorback sucker (<i>Xyrauchen texanus</i>) > 100 mg/l, 96 hours

Persistence and degradability The product is not biodegradable.

Bioaccumulative potential The product contains potentially bioaccumulating substances.

Mobility in soil Not available.

Other adverse effects Not available.

13. Disposal considerations

Disposal instructions Dispose in accordance with all applicable regulations.

Hazardous waste code D011: Waste Silver

Waste from residues / unused products Dispose of in accordance with local regulations. Scrapped material should be sent for refining to recover precious metal content. Solid metal and alloys in the form of particles may be reactive. Its hazardous characteristics, including fire and explosion, should be determined prior to disposal.

Contaminated packaging Since emptied containers may retain product residue, follow label warnings even after container is emptied.

14. Transport information

DOT

Not regulated as dangerous goods.

IATA

Not regulated as dangerous goods.

IMDG

Not regulated as dangerous goods.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code Not applicable.**15. Regulatory information****US federal regulations** This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.
All components are on the U.S. EPA TSCA Inventory List.**TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)**

Not regulated.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not listed.

CERCLA Hazardous Substance List (40 CFR 302.4)

Copper (CAS 7440-50-8)	LISTED
Nickel (CAS 7440-02-0)	LISTED
Silver (CAS 7440-22-4)	LISTED
Zinc (CAS 7440-66-6)	LISTED

Superfund Amendments and Reauthorization Act of 1986 (SARA)**Hazard categories** Immediate Hazard - No
Delayed Hazard - No
Fire Hazard - No
Pressure Hazard - No
Reactivity Hazard - No**SARA 302 Extremely hazardous substance**

Not listed.

SARA 311/312 Hazardous chemical Yes**SARA 313 (TRI reporting)**

Chemical name	CAS number	% by wt.
Silver	7440-22-4	40 - 56
Copper	7440-50-8	20 - 40
Zinc	7440-66-6	2 - 28
Nickel	7440-02-0	1 - 2

Other federal regulations**Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List**

Nickel (CAS 7440-02-0)

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Not regulated.

Safe Drinking Water Act (SDWA) Not regulated.**US state regulations** WARNING: This product contains a chemical known to the State of California to cause cancer and birth defects or other reproductive harm.**US. Massachusetts RTK - Substance List**Copper (CAS 7440-50-8)
Nickel (CAS 7440-02-0)
Silver (CAS 7440-22-4)
Zinc (CAS 7440-66-6)**US. New Jersey Worker and Community Right-to-Know Act**Boric acid (CAS 10043-35-3)
Copper (CAS 7440-50-8)
Fluorides (CAS 16984-48-8)
Nickel (CAS 7440-02-0)
Potassium tetraborate tetrahydrate (CAS 12045-78-2)

Silver (CAS 7440-22-4)

Zinc (CAS 7440-66-6)

US. Pennsylvania Worker and Community Right-to-Know Law

Copper (CAS 7440-50-8)

Fluorides (CAS 16984-48-8)

Nickel (CAS 7440-02-0)

Potassium fluoroborate (CAS 14075-53-7)

Silver (CAS 7440-22-4)

Zinc (CAS 7440-66-6)

US. Rhode Island RTK

Copper (CAS 7440-50-8)

Nickel (CAS 7440-02-0)

Silver (CAS 7440-22-4)

Zinc (CAS 7440-66-6)

US. California Proposition 65

US - California Proposition 65 - Carcinogens & Reproductive Toxicity (CRT): Listed substance

Nickel (CAS 7440-02-0)

International Inventories

Country(s) or region	Inventory name	On inventory (yes/no)*
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates this product complies with the inventory requirements administered by the governing country(s).

A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

16. Other information, including date of preparation or last revision

Issue date Draft version.

Revision date Draft version.

Version # Draft version.

Further information HMIS® is a registered trade and service mark of the NPCA.

HMIS® ratings Health: 0
Flammability: 0
Physical hazard: 0

References ACGIH
EPA: AQUIRE database
NLM: Hazardous Substances Data Base
US. IARC Monographs on Occupational Exposures to Chemical Agents
HSDB® - Hazardous Substances Data Bank
IARC Monographs. Overall Evaluation of Carcinogenicity
National Toxicology Program (NTP) Report on Carcinogens
ACGIH Documentation of the Threshold Limit Values and Biological Exposure Indices

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