MATERIAL SAFETY DATA SHEET

1. Product and Company Identification

Material name	**Harris 15 Low Fuming Bronze / Harris America Low Fuming Bronze**
Version #	01
Issue date	07-October-2013
Revision date	-
Supersedes date	-
CAS #	Mixture
Product use	Metal brazing.
Manufacturer information	
Manufacturer/Supplier	Harris Products Group 4501 Quality Place Mason, Ohio 45040 US salesinfo@jwharris.com
Telephone number	513-754-2000
Emergency Telephone Numbers	1-866-519-4752 (US, Canada, Mexico only) (+) 1-760-476-3962 Please quote 333895

2. Hazards Identification

Physical state	Solid.
Appearance	Bronze rods.
Emergency overview	May cause eye, skin and respiratory tract irritation.
OSHA regulatory status	When used for its intended purposes, this material is not classified as hazardous in accordance with OSHA 29 CFR 1910.1200.
Potential health effects	
Routes of exposure	Inhalation. Skin contact. Eye contact. Ingestion.
Eyes	Fumes from heated material may cause eye irritation. Dust may irritate the eyes. Exposure to hot material may cause thermal burns.
Skin	Contact may cause irritation and redness. Prolonged skin contact may cause dermatitis. Contact with molten material may cause thermal burns.
Inhalation	Irritating to the nose, throat, and respiratory tract. Overexposure to Copper fumes may produce metal fume fever. Symptoms of metal fume fever resemble the flu and include sweating, fever, headache, chills, muscle aches, nausea, vomiting, weakness, and tiredness.
Ingestion	Copper poisoning can result in hemolytic anemia and kidney, liver and spleen damage.
Target organs	Respiratory system. Eyes. Skin. Kidneys. Liver.
Chronic effects	Chronic inhalation of fumes or dust may cause irritation or other respiratory conditions (e.g., bronchitis). May cause damage to the liver and kidneys. Refer to Section 11 Toxicological Information for more details.
Signs and symptoms	During brazing operations, the most significant route of overexposure is via inhalation of fumes. Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting. Dust and fumes may irritate eyes, skin and upper respiratory tract.
Potential environmental effects	Alloys in massive forms present a limited hazard for the environment.

3. Composition / Information on Ingredients

Components	CAS #	Percent
Copper	7440-50-8	56 - 60.5
Tin	7440-31-5	0.3 - 1.1
Iron	7439-89-6	0.0 - 1.2
Manganese	7439-96-5	0.01 - 0.5

Components	CAS #	Percent
Silicon	7440-21-3	< 0.3
Zinc	7440-66-6	Balance

Composition comments

Rods may be coated with flux containing Boric acid (CAS 10043-35-3) and Borax (CAS 1303-96-4). It can be reasonably assumed that on coated rods each of the flux constituents will comprise less than 1% 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.

4. First Aid Measures

First aid procedures

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.

Skin contact

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

Inhalation

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

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.

Notes to physician

Treat symptomatically.

General advice

Show this safety data sheet to the doctor in attendance.

5. Fire Fighting Measures

Flammable properties

Solid metal is not flammable; however, finely divided metallic dust or powder may form an explosive mixture with air. Do not use water on molten metal: Explosion hazard could result.

Extinguishing media

Suitable extinguishing media

Extinguish with foam, carbon dioxide or dry powder.

Unsuitable extinguishing media

Do not use water jet as an extinguisher, as this will spread the fire.

Protection of firefighters

Specific hazards arising from the chemical

Fire or high temperatures create: Metal oxides.

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

Keep unnecessary personnel away. Avoid inhalation of dust from the spilled material. Wear protective clothing as described in Section 8 of this MSDS. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.

Environmental precautions

Do not contaminate water.

Methods for containment

Stop leak if you can do so without risk. Local authorities should be advised if significant spillages cannot be contained.

Methods for cleaning up

Collect for recycling. Avoid the generation of dusts during clean-up. For waste disposal, see Section 13 of the MSDS.

Other information

Clean up in accordance with all applicable regulations.

7. Handling and Storage

Handling

Avoid inhalation of dust and fumes. Avoid contact with skin and eyes. Keep formation of airborne dusts to a minimum. Provide appropriate exhaust ventilation at places where dust is formed. Wear appropriate personal protective equipment (See Section 8). Do not eat, drink or smoke when using the product. Wash thoroughly after handling. Avoid release to the environment.

Storage

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. ACGIH Threshold Limit Values

Components	Type	Value	Form
Copper (CAS 7440-50-8)	TWA	1 mg/m3	Dust and mist.
		0.2 mg/m3	Fume.
Iron oxide (CAS -)	TWA	5 mg/m3	Respirable fraction.
Manganese (CAS 7439-96-5)	TWA	0.1 mg/m3	Inhalable fraction.
		0.02 mg/m3	Respirable fraction.
Tin (CAS 7440-31-5)	TWA	2 mg/m3	
Zinc oxide (CAS -)	STEL	10 mg/m3	Respirable fraction.
	TWA	2 mg/m3	Respirable fraction.

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/m3	Dust and mist.
		0.1 mg/m3	Fume.
Iron oxide (CAS -)	PEL	10 mg/m3	Fume.
Manganese (CAS 7439-96-5)	Ceiling	5 mg/m3	Fume.
Silicon (CAS 7440-21-3)	PEL	5 mg/m3	Respirable fraction.
		15 mg/m3	Total dust.
Tin (CAS 7440-31-5)	PEL	2 mg/m3	
Zinc oxide (CAS -)	PEL	5 mg/m3	Respirable fraction.
		5 mg/m3	Fume.
		15 mg/m3	Total dust.

Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2)

Components	Type	Value	Form
Copper (CAS 7440-50-8)	TWA	1 mg/m3	Dust and mist.
		0.2 mg/m3	Fume.
Iron oxide (CAS -)	TWA	5 mg/m3	Respirable.
Manganese (CAS 7439-96-5)	TWA	0.2 mg/m3	
Tin (CAS 7440-31-5)	TWA	2 mg/m3	
Zinc oxide (CAS -)	STEL	10 mg/m3	Respirable.
	TWA	2 mg/m3	Respirable.

Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended)

Components	Type	Value	Form
Copper (CAS 7440-50-8)	TWA	1 mg/m3	Dust and mist.
		0.2 mg/m3	Fume.
Iron oxide (CAS -)	STEL	10 mg/m3	Fume.
	TWA	5 mg/m3	Fume.
		5 mg/m3	Dust.
		3 mg/m3	Respirable fraction.
		10 mg/m3	Total dust.
Manganese (CAS 7439-96-5)	TWA	0.2 mg/m3	
Tin (CAS 7440-31-5)	TWA	2 mg/m3	
Zinc oxide (CAS -)	STEL	10 mg/m3	Respirable.
	TWA	2 mg/m3	Respirable.

Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents)

Components	Type	Value	Form
Copper (CAS 7440-50-8)	TWA	0.2 mg/m3	Fume.
Iron oxide (CAS -)	TWA	5 mg/m3	Respirable fraction.

Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents)

Components	Type	Value	Form
Manganese (CAS 7439-96-5)	TWA	0.2 mg/m3	
Silicon (CAS 7440-21-3)	TWA	10 mg/m3	Total dust.
Tin (CAS 7440-31-5)	TWA	2 mg/m3	
Zinc oxide (CAS -)	STEL	10 mg/m3	Respirable fraction.
	TWA	2 mg/m3	Respirable fraction.

Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment)

Components	Type	Value	Form
Copper (CAS 7440-50-8)	TWA	1 mg/m3	Dust and mist.
		0.2 mg/m3	Fume.
Iron oxide (CAS -)	TWA	5 mg/m3	Dust and fume.
		10 mg/m3	Total dust.
Manganese (CAS 7439-96-5)	STEL	3 mg/m3	Fume.
	TWA	5 mg/m3	Dust.
		1 mg/m3	Fume.
Silicon (CAS 7440-21-3)	TWA	10 mg/m3	Total dust.
Tin (CAS 7440-31-5)	TWA	2 mg/m3	
Zinc oxide (CAS -)	STEL	10 mg/m3	Fume.
	TWA	5 mg/m3	Fume.
		10 mg/m3	Total dust.

Mexico. Occupational Exposure Limit Values

Components	Type	Value	Form
Copper (CAS 7440-50-8)	STEL	2 mg/m3	Fume.
		2 mg/m3	Dust and mist.
	TWA	1 mg/m3	Dust and mist.
		0.2 mg/m3	Fume.
Iron oxide (CAS -)	STEL	10 mg/m3	
	TWA	5 mg/m3	
Manganese (CAS 7439-96-5)	STEL	3 mg/m3	Fume.
	TWA	1 mg/m3	Fume.
		0.2 mg/m3	
Silicon (CAS 7440-21-3)	STEL	20 mg/m3	
	TWA	10 mg/m3	
Tin (CAS 7440-31-5)	STEL	4 mg/m3	
	TWA	2 mg/m3	
Zinc oxide (CAS -)	STEL	10 mg/m3	Fume.
	TWA	5 mg/m3	Fume.
		10 mg/m3	Dust.

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.

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 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 NIOSH/MSHA approved respirator if there is a risk of exposure to dust/fume at levels exceeding the exposure limits. 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. At work in confined or poorly ventilated spaces, respiratory protection with air supply must be used.

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 & Chemical Properties

Appearance	Bronze rods.
Physical state	Solid.
Form	Solid.
Color	Bronze.
Odor	Odorless.
Odor threshold	Not available.
pH	Not available.
Vapor pressure	Not available.
Vapor density	Not available.
Boiling point	Not available.
Melting point/Freezing point	1680 °F (915.56 °C)
Solubility (water)	Not available.
Specific gravity	Not available.
Flash point	Not available.
Flammability limits in air, upper, % by volume	Not available.
Flammability limits in air, lower, % by volume	Not available.
Auto-ignition temperature	Not available.

10. Chemical Stability & Reactivity Information

Chemical stability	Material is stable under normal conditions.
Conditions to avoid	Extreme temperatures. Contact with incompatible materials.
Incompatible materials	Strong oxidizing agents. Strong acids. Strong bases. Halogens.
Hazardous decomposition products	Thermal decomposition may produce copper, zinc compounds and a variety of metal oxides.
Possibility of hazardous reactions	Will not occur.

11. Toxicological Information

Toxicological data

Components	Species	Test Results
Iron (CAS 7439-89-6)		
Acute		
Oral		
LD50	Rat	30 g/kg
Manganese (CAS 7439-96-5)		
Acute		
Oral		
LD50	Rat	9000 mg/kg
Silicon (CAS 7440-21-3)		
Acute		
Oral		
LD50	Rat	3160 mg/kg

Components	Species	Test Results
Zinc (CAS 7440-66-6)		
Acute		
Oral		
LD50	Rat	630 mg/kg

Sensitization	Rare cases of allergic contact dermatitis have been reported in people working with copper dust.
Acute effects	High concentrations of freshly formed fumes/dusts of metal oxides can produce symptoms of metal fume fever. When heated, the vapors/fumes given off may cause respiratory tract irritation.
Local effects	Elevated temperatures or mechanical action may form dust and fumes which may be irritating to the eye, mucous membranes and respiratory tract.
Chronic effects	Prolonged exposure may cause chronic effects.
Carcinogenicity	Not classifiable as to carcinogenicity to humans.

ACGIH Carcinogens

Manganese (CAS 7439-96-5)	A4 Not classifiable as a human carcinogen.

Epidemiology	No data available.
Mutagenicity	Not classified.
Reproductive effects	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.
Further information	No other specific acute or chronic health impact noted.

12. Ecological Information

Ecotoxicological data

Components		Species	Test Results
Copper (CAS 7440-50-8)			
Aquatic			
Crustacea	EC50	Water flea (Daphnia obtusa)	0.0076 - 0.026 mg/l, 48 hours
Iron (CAS 7439-89-6)			
Aquatic			
Fish	LC50	Channel catfish (Ictalurus punctatus)	> 500 mg/l, 96 hours
Zinc (CAS 7440-66-6)			
Aquatic			
Crustacea	EC50	Water flea (Daphnia magna)	2.8 mg/l, 48 hours
Fish	LC50	Rainbow trout,donaldson trout (Oncorhynchus mykiss)	0.56 mg/l, 96 hours

Ecotoxicity	Alloys in massive forms present a limited hazard for the environment.
Environmental effects	Significant environmental persistence and bioaccumulation can be expected.
Aquatic toxicity	If in form of particles or dust, some metals of the alloy are hazardous to aquatic organisms and/or may cause long-term adverse effects in the aquatic environment.
Persistence and degradability	The product is not biodegradable.
Bioaccumulation / Accumulation	The product contains potentially bioaccumulating substances.
Mobility in environmental media	Alloys in massive forms are not mobile in the environment.

13. Disposal Considerations

Disposal instructions	Dispose in accordance with all applicable regulations.
Waste from residues / unused products	Recover and recycle, if practical. 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.

14. Transport Information

DOT

Not regulated as a hazardous material by DOT.

IATA

Not regulated as dangerous goods.

IMDG

Not regulated as dangerous goods.

TDG

Not regulated as dangerous goods.

15. Regulatory Information

US federal regulations

This product is not known to be 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.

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

Manganese (CAS 7439-96-5)

US EPCRA (SARA Title III) Section 313 - Toxic Chemical: De minimis concentration

Copper (CAS 7440-50-8)	1.0 %
Manganese (CAS 7439-96-5)	1.0 %
Zinc (CAS 7440-66-6)	1.0 %

US EPCRA (SARA Title III) Section 313 - Toxic Chemical: Listed substance

Copper (CAS 7440-50-8)	Listed.
Manganese (CAS 7439-96-5)	Listed.
Zinc (CAS 7440-66-6)	Listed.

CERCLA (Superfund) reportable quantity (lbs) (40 CFR 302.4)

Copper: 5000
Zinc: 1000

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
Section 302 extremely hazardous substance (40 CFR 355, Appendix A)	No
SARA 311/312 Hazardous chemical	No

Drug Enforcement Administration (DEA) (21 CFR 1308.11-15)

Not controlled

Canadian regulations

This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

WHMIS status

Non-controlled

Inventory status

Country(s) or region	Inventory name	On inventory (yes/no)*
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No

Country(s) or region	Inventory name	On inventory (yes/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).

State regulations

This product does not contain a chemical known to the State of California to cause cancer, birth defects or other reproductive harm.

US - California Hazardous Substances (Director's): Listed substance

Copper (CAS 7440-50-8)	Listed.
Iron (CAS 7439-89-6)	Listed.
Manganese (CAS 7439-96-5)	Listed.
Tin (CAS 7440-31-5)	Listed.
Zinc (CAS 7440-66-6)	Listed.

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

Not listed.

US - New Jersey RTK - Substances: Listed substance

Copper (CAS 7440-50-8)	Listed.
Manganese (CAS 7439-96-5)	Listed.
Silicon (CAS 7440-21-3)	Listed.
Tin (CAS 7440-31-5)	Listed.
Zinc (CAS 7440-66-6)	Listed.

US - Pennsylvania RTK - Hazardous Substances: All compounds of this substance are considered environmental hazards

Copper (CAS 7440-50-8)	LISTED
Manganese (CAS 7439-96-5)	LISTED
Zinc (CAS 7440-66-6)	LISTED

US. Massachusetts RTK - Substance List

Copper (CAS 7440-50-8)	Listed.
Manganese (CAS 7439-96-5)	Listed.
Silicon (CAS 7440-21-3)	Listed.
Tin (CAS 7440-31-5)	Listed.
Zinc (CAS 7440-66-6)	Listed.

US. New Jersey Worker and Community Right-to-Know Act

Copper (CAS 7440-50-8)	500 lbs
Manganese (CAS 7439-96-5)	500 lbs
Zinc (CAS 7440-66-6)	500 lbs

US. Pennsylvania RTK - Hazardous Substances

Copper (CAS 7440-50-8)	Listed.
Manganese (CAS 7439-96-5)	Listed.
Silicon (CAS 7440-21-3)	Listed.
Tin (CAS 7440-31-5)	Listed.
Zinc (CAS 7440-66-6)	Listed.

Mexico regulations

This safety data sheet was prepared in accordance with the Official Mexican Standard (NOM-018-STPS-2000).

16. Other Information

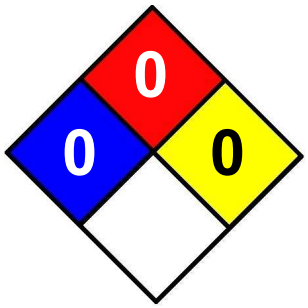
Further information

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

HMIS® ratings

Health: 1
Flammability: 0
Physical hazard: 0

NFPA Ratings



Disclaimer

The information in the sheet was written based on the best knowledge and experience currently available.