



Harris Products Group  
Since 1905

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## Safety Data Sheet

**WARNING: PRODUCT COMPONENTS PRESENT HEALTH AND SAFETY HAZARDS. READ AND UNDERSTAND THIS MATERIAL SAFETY DATA SHEET (M.S.DS.). ALSO, FOLLOW YOUR EMPLOYER'S SAFETY PRACTICES.**

The information contained herein relates only to the specific product. If the product is combined with other materials, all component properties must be considered. **BE SURE TO CONSULT THE LATEST VERSION OF THE MSDS. MATERIAL SAFETY DATA SHEETS ARE AVAILABLE FROM HARRIS PRODUCTS GROUP** Harris Products Group, HGE PTY LTD, Brisbane | Melbourne | Perth | New Zealand, 14 Queensland Rd, Darra, QLD 4076, Phone: (07) 3375 3670 | Fax: (07) 3375 3620, Email: sales@hgea.com.au, www.harrisproductsgroup.com.au,

### STATEMENT OF LIABILITY-DISCLAIMER

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## 1. PRODUCT IDENTIFICATION

<b>TRADE NAME (AS LABELED):</b>	<b>PHOS/COPPER BRAZING ALLOYS:</b>	
<b>DYNAFLOW<sup>®</sup></b>	LCuP 8	<b>STAY-SILV<sup>®</sup> 5HP (LAg5PB)</b>
<b>SUPER DYNAFLOW<sup>®</sup></b>	LCuPSn-7	<b>STAY-SILV<sup>®</sup> 5LP</b>
<b>HARRIS 0</b>	<b>PHOSON +<sup>®</sup></b>	<b>STAY-SILV<sup>®</sup> 6</b>
<b>HARRIS 0AM</b>	PSN 4	<b>STAY-SILV<sup>®</sup> 6.5</b>
<b>HARRIS 0LP</b>	<b>QUICKSILVER<sup>®</sup></b>	<b>STAY-SILV<sup>®</sup> 6HP</b>
<b>HARRIS 0HP (LCuP 7)</b>	<b>STAY-SILV<sup>®</sup> 2</b>	<b>STAY-SILV<sup>®</sup> 6LP</b>
<b>HARRIS 0HHP</b>	<b>STAY-SILV<sup>®</sup> 2.5</b>	<b>STAY-SILV<sup>®</sup> 15</b>
<b>HARRIS 0XHP</b>	<b>STAY-SILV<sup>®</sup> 2HP</b>	<b>STAY-SILV<sup>®</sup> 15HP</b>
<b>LAg2PA</b>	<b>STAY-SILV<sup>®</sup> 2LP (LAg2PB)</b>	<b>STAY-SILV<sup>®</sup> 15LP</b>
<b>LAg5PA</b>	<b>STAY-SILV<sup>®</sup> 5</b>	<b>STAY-SILV<sup>®</sup> 18LP (18M)</b>
<b>LCuP 6</b>	<b>FLASH<sup>®</sup></b>	<b>BLOCKADE<sup>®</sup> Bare &amp; Flux-Coated</b>
<b>MB-15</b>	<b>SILV 1T</b>	<b>STAY-SILV<sup>®</sup> 18</b>
<b>CHEMICAL NAME/CLASS:</b>	Metal Brazing Alloy	
<b>SYNONYMS:</b>	Not Applicable	
<b>PRODUCT USE:</b>	Metal Brazing	
<b>DOCUMENT NUMBER:</b>	0082	
<b>SUPPLIER/MANUFACTURER'S NAME:</b>	<b>HARRIS Products Group</b>	
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## 2. NOMINAL COMPOSITION and INFORMATION ON INGREDIENTS

PRODUCT NAME	Ag	Cu	Sn	Si	P
DYNAFLOW <sup>®</sup>	6.0	Balance			6.1
SUPER DYNAFLOW <sup>®</sup>	18.0	Balance			7.3
HARRIS 0		Balance			7.1
HARRIS 0AM		Balance			6.95
HARRIS 0LP		Balance			6.8

HARRIS OHP (LCuP 7)		Balance			7.4
HARRIS OHHP		Balance			7.6
HARRIS OXHP		Balance			7.8

## 2. NOMINAL COMPOSITION and INFORMATION ON INGREDIENTS (Continued)

PRODUCT NAME	Ag	Cu	Sn	Si	P
LAg2PA	1.7	Balance			6.4
LAg5PA	4.6	Balance			6.3
LCuP 6		Balance			6.5
LCuP 8		Balance			8.1
LCuPSn-7		Balance	7.0		6.8
PHOSON +®	15.0	Balance			7.3
PSN 4		Balance	4.0		6.0
QUICKSILVER®		Balance			7.2
STAY-SILV® 2	2.0	Balance			7.0
STAY-SILV® 2.5	2.4	Balance			6.4
STAY-SILV® 2HP	2.0	Balance			7.4
STAY-SILV® 2LP (LAgPB)	2.0	Balance			6.5
STAY-SILV® 5	5.0	Balance			6.0
STAY-SILV® 5HP (LAg5PB)	5.0	Balance			6.5
STAY-SILV® 5LP	5.0	Balance			5.7
STAY-SILV® 6	6.0	Balance			6.5
STAY-SILV® 6.5	6.4	Balance			6.1
STAY-SILV® 6HP	6.0	Balance			7.2
STAY-SILV® 6LP	6.0	Balance			6.2
STAY-SILV® 15	15.0	Balance			5.0
STAY-SILV® 15HP	15.0	Balance			5.4
STAY-SILV® 15LP	15.0	Balance			4.7
MB-15	15.0	Balance			5.0
STAY-SILV® 18LP (18M)	18.0	Balance			5.8
STAY-SILV 1T	1.0-1.2	Balance	0.04-0.06		6.0-6.2
FLASH®		Balance			8.2
MB-15	15.0	Balance			5.0
BLOCKADE®		Balance	<10.0	<4.0	<8.0

CHEMICAL NAME	CAS #	EXPOSURE LIMITS IN AIR					
		ACGIH-TLV		OSHA-PEL		IDLH	OTHER
		TWA	STEL	TWA	STEL		
mg/m <sup>3</sup>	mg/m <sup>3</sup>	mg/m <sup>3</sup>	mg/m <sup>3</sup>	mg/m <sup>3</sup>	mg/m <sup>3</sup>		
Phosphorous (yellow)	7723-14-0	0.1	NE	0.1	NE	5	NIOSH REL: TWA = 0.1 DFG MAKs: TWA = 0.1 PEAK = 2•MAK 5 min., momentary value DFG Pregnancy Risk Classification: D Carcinogen: EPA-D
Tin The following exposure limits are for "Tin, Metal"	7440-31-5	2	NE	2	NE	100	NIOSH REL: TWA = 2
Silicon	7440-21-3	10	NE	15 (Total dust) 5 (Respirable fraction) 10 (Total dust) (vacated 1989 PEL)	NE	NE	NIOSH REL: TWA = 10 (Total dust); 5 (Respirable fraction)
Silver, Metal	7440-22-4	0.1	NE	0.01	NE	10	NIOSH REL: TWA = 0.01 DFG MAK: TWA = 0.01 (Inhalable Fraction) PEAK = 10•MAK 30 min., average value Carcinogen: EPA-D

Copper (exposure limits are for "Copper fume, as Cu")	7440-50-8	0.2 (fume) 1 (dusts & mists)	NE	0.1 (fume) 1 (dusts & mists)	NE	100	NIOSH REL: TWA = 0.1 DFG MAK: TWA = 0.1 (Inhalable Fraction) PEAK = 2•MAK 30 min., average value Carcinogen: EPA-D
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NE = Not Established.

See Section 16 for Definitions of Terms Used.

NOTE (1): The ACGIH has an established exposure limit for Brazing Fumes, Not Otherwise Classified. The Threshold Limit Value is 5 mg/m<sup>3</sup>. NIOSH classifies Brazing fumes as carcinogens. Single values shown are maximum, unless otherwise noted.

NOTE (2): ALL WHMIS required information is included in appropriate sections based on the ANSI Z400.1-1998 format. 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.

## 2. NOMINAL COMPOSITION and INFORMATION ON INGREDIENTS (Continued)

Flux coated BLOCKADE consist of metal wire or rods, with a thin coating of flux on them. The exact amount of coating on each rod may vary. It can be reasonably estimated that there is less than 1% of each of the flux constituents present on any given rod when compared to the mass of the rod itself. The composition values given for the flux coating are the composition of the flux when the rods are flux-coated.

### COMPONENT 2: FLUX COATING ON BLOCKADE FLUX COATED RODS

CHEMICAL NAME	CAS #	% w/w	EXPOSURE LIMITS IN AIR					
			ACGIH-TLV		OSHA-PEL		IDLH mg/m <sup>3</sup>	OTHER mg/m <sup>3</sup>
			TLV mg/m <sup>3</sup>	STEL mg/m <sup>3</sup>	PEL mg/m <sup>3</sup>	STEL mg/m <sup>3</sup>		
Boric Acid	10043-35-3	10-35	NE	NE	NE	NE	NE	NE
Proprietary Fluoride Compound (exposure limits are for inorganic, solid Fluoride compounds, as F; 7789-75-5)	Proprietary	30-50	2.5, A4 (Not Classifiable as a human carcinogen)	NE	2.5	NE	NE	DFG MAKs:TWA = 2.5 (Inhalable Fraction) PEAK = 5•MAK 30 min., average value Carcinogen: IARC-3, TLV-A4
Methacrylate/Aliphatic & Naphthenic Hydrocarbon Compound	Proprietary		NE	NE	NE	NE	NE	NE
Water	7732-18-5	Balance	NE	NE	NE	NE	NE	NE

## 3. HAZARD IDENTIFICATION

**EMERGENCY OVERVIEW:** These products consist of odorless, metallic, copper-colored wires and rods in a variety of diameters which may have a flux coating. There is no immediate health hazard associated with the wire products. These products are not reactive under normal circumstances of use. Though the products are not flammable, when heated they will produce fumes containing a variety of copper and silver compounds. Emergency responders must wear personal protective equipment suitable for the situation to which they are responding.

### GHS classification of the substance/mixture.



Classified according to the Globally Harmonised System of Classification and labelling of Chemicals (GHS) including Work, Health and Safety regulations, Australia.

### SYMPTOMS OF OVEREXPOSURE BY ROUTE OF EXPOSURE:

During brazing operations, the most significant route of overexposure is via inhalation of fumes.

**INHALATION** Exposure to fumes of these products will irritate the nose, throat and other tissues of the respiratory system. 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. If dusts or particulates generated by the flux coating on the flux coated products are inhaled, they will irritate the nose, throat, and lungs. Dusts and particulates of the flux coating on the flux coated products may destroy mucous membranes and may cause pneumonitis.

**CONTACT WITH SKIN or EYES:** Contact with the wire or rod forms of these products is not anticipated to be irritating. Contact with the wire form can be physically damaging to the eye. Fumes generated during brazing or welding operations can irritate the skin and eyes. Symptoms of skin overexposure may include irritation and redness; prolonged or repeated skin overexposures may lead to dermatitis. Contact with the molten material will burn contaminated skin or eyes. Eye contact with dusts or particulates generated by the flux coating on the flux coated products will cause irritation, pain, tearing, and reddening. Brief contact may cause eye damage and prolonged contact may cause permanent damage. Depending on the duration of over-exposure, skin contact with dusts or particulates generated by the flux coating on the flux coated products may cause irritation and burns. Chronic over-exposure to dusts or particulates generated by the flux coating on the flux coated products may cause borism (dry skin, eruptions, and gastrointestinal disturbances) or pustular dermatitis (visible collections of pus).

HAZARDOUS MATERIAL IDENTIFICATION SYSTEM			
HEALTH		(BLUE)	1
FLAMMABILITY		(RED)	0
REACTIVITY		(YELLOW)	0
PROTECTIVE EQUIPMENT		X	
EYES	RESPIRATORY	HANDS	BODY
	See Section 8		See Section 8
For routine industrial applications			

### 3. HAZARD IDENTIFICATION (Continued)

**SKIN ABSORPTION:** Skin absorption is not a significant route of overexposure for any component of these bare products. In some situations, one of the decomposition products of the flux coating may be hydrogen fluoride. Hydrogen fluoride can penetrate the skin and produce burns that may not be immediately painful or visible; the burns impact the lower layers of skin and bone tissue. Hydrogen fluoride exposures involving 20 percent of the body or more can be fatal through systemic fluoride poisoning.

**INGESTION:** Ingestion of the rods is not a likely route of occupational exposure.

**INJECTION:** Though not a likely route of occupational exposure for these products, injection (via punctures or lacerations in the skin) may cause local reddening, tissue swelling, and discomfort.

**HEALTH EFFECTS OR RISKS FROM EXPOSURE: An Explanation in Lay Terms.** Symptoms associated with overexposure to these products and the fumes generated during brazing operations are as follows:

**ACUTE:** The chief health hazard associated with these products would be the potential for overexposure to fumes during brazing operations. Overexposure to Copper fumes may produce metal fume fever. Contact with the molten material will burn contaminated skin or eyes. Depending on the duration of over-exposure, dusts or particulates generated by the flux coating on the flux coated products may be irritating or damaging to the entire respiratory tract, eyes, and skin. In some situations, one of the flux coating's decomposition products may be hydrogen fluoride. Hydrogen fluoride can penetrate the skin and produce burns that may not be immediately painful or visible; the burns impact the lower layers of skin and bone tissue. If dusts or particulates generated by the flux coating on the flux coated products are swallowed, they may burn the mouth, throat, esophagus, and other tissues of the digestive system.

**CHRONIC:** Chronic skin overexposure to the fumes of these products during brazing operations may produce dermatitis (red, inflamed skin). Chronic skin over-exposure to dusts or particulates generated by the flux coating on the flux coated products may cause borism (dry skin, eruptions, and gastrointestinal disturbances) or pustular dermatitis (visible collections of pus). Chronic ingestion of the fluoride component of the flux coating may cause osseous fluorosis (increased radiographic density of the bones). Symptoms of chronic ingestion of dusts or particulates generated by the flux coating on the flux coated products may include kidney damage, asthma, and pain in the joints and muscles. Chronic skin contact or ingestion of dusts, salts, or fumes of Silver, (a component of these products) can result in a condition known as Argyria. This condition is marked by a bluish appearance of the skin and eyes. Refer to Section 11 (Toxicological Information) for further information.

**TARGET ORGANS:** ACUTE: Skin, eyes, and respiratory system.

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## 4. FIRST-AID MEASURES

Victims of chemical exposure must be taken for medical attention. Rescuers should be taken for medical attention, if necessary. Take a copy of label and MSDS to health professional with victim.

**SKIN EXPOSURE:** If dust or particulates generated by the flux coating on the flux coated products or fumes generated by brazing operations involving this product contaminate the skin, begin decontamination with running water. If molten material contaminates the skin, immediately begin decontamination with cold, running water. Minimum flushing is for 15 minutes. Victim must seek medical attention if any adverse reaction occurs.

**EYE EXPOSURE:** If dust or particulates generated by the flux coating on the flux coated products or fumes generated by brazing operations involving this product enter the eyes, open victim's eyes while under gently running water. Use sufficient force to open eyelids. Have victim "roll" eyes. Minimum flushing is for 15 minutes. Victim must seek immediate medical attention.

**INHALATION:** If dust or particulates generated by the flux coating on the flux coated products or fumes generated by brazing operations involving this product are inhaled, remove victim to fresh air. If necessary, use artificial respiration to support vital functions.

**INGESTION:** Ingestion is not a likely route of exposure for these products. If swallowed call physician immediately! Do not induce vomiting unless directed by medical personnel. Rinse mouth with water if person is conscious. Never give fluids or induce vomiting if person is unconscious, having convulsions, or not breathing.

**MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:** Skin and respiratory disorders, may be aggravated by prolonged overexposures to the fumes of these products.

**RECOMMENDATIONS TO PHYSICIANS:** Treat symptoms and eliminate overexposure.

## 5. FIRE-FIGHTING MEASURES

Read and understand the Work Safe Australia Code of Practice on Welding Processes and "Standard for Fire Prevention During Welding, Cutting and Other Hot Work" before using this product. Section 274 of the Work Health and Safety Act (the WHS Act.)

**FLASH POINT:** Not flammable.

**AUTOIGNITION TEMPERATURE:** Not flammable.

**FLAMMABLE LIMITS (in air by volume, %):**

Lower (LEL): Not applicable.

Upper (UEL): Not applicable.

**FIRE EXTINGUISHING MATERIALS:**

Water Spray: YES

Halon: YES

Dry Chemical: YES

Carbon Dioxide: YES

Foam: YES

Other: Any "ABC" Class

**UNUSUAL FIRE AND EXPLOSION HAZARDS** When involved in a fire, these products may generate irritating fumes and a variety of metal oxides. If involved in a fire, the flux coating on the flux coated products may decompose to release fluoride compounds, boric anhydride, and hydrogen fluoride. The molten rods can present significant thermal hazards to firefighters.

Explosion Sensitivity to Mechanical Impact: Not sensitive.

Explosion Sensitivity to Static Discharge: Not sensitive.

**SPECIAL FIRE-FIGHTING PROCEDURES:** Not applicable.

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## 6. ACCIDENTAL RELEASE MEASURES

**SPILL AND LEAK RESPONSE:** Not applicable.

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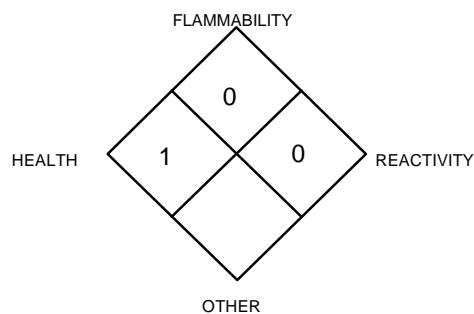
## 7. HANDLING and STORAGE

**WORK PRACTICES AND HYGIENE PRACTICES:** As with all chemicals, avoid getting these products ON YOU or IN YOU. Wash thoroughly after handling these products. Do not eat or drink while handling these products. Use ventilation and other engineering controls to minimize potential exposure these products.

**STORAGE AND HANDLING PRACTICES:** All employees who handle these products should be trained to handle them safely. Use in a well-ventilated location. Avoid breathing fumes generated by these products during brazing operations. Packages of these products must be properly labeled. Store containers in a cool, dry location. Store away from incompatible materials (see Section 10, Stability and Reactivity).

Read and understand the manufacturer's instruction and the precautionary label on the product. Refer to Lincoln Safety Publications at [www.lincolnelectric.com/safety](http://www.lincolnelectric.com/safety). See the Australian Standard - AS 1674.1 – 1997 – Reconfirmed 2016. Safety in Welding and Allied Processes Australia.

### NFPA RATING



**See Section 16 for  
Definition of Ratings**

## 8. EXPOSURE CONTROLS - PERSONAL PROTECTION

### Exposure Guidelines:

Refer to the Safe Environments risk management document – Welding Fume - <http://www.safeenvironments.com.au/welding-fume/> The exposure standard refers to the publication by Work Safe Australia “Workplace Exposure Standard for Airborne Contaminants” with the Date of Effect being 22 December 2011. Work Safe Australia note that “exposure standards do not represent a fine dividing line between a healthy and unhealthy work environment. Natural biological variation and the range of individual susceptibilities mean that a small number of people might experience adverse health effects below the exposure standard.

**VENTILATION AND ENGINEERING CONTROLS:** Use with adequate ventilation to ensure exposure levels are maintained below the limits provided in Section 2 (Composition and Information on Ingredients). Prudent practice is to ensure eyewash/safety shower stations are available near areas where these products are used.

**RESPIRATORY PROTECTION:** Maintain airborne contaminant concentrations below guidelines listed in Section 2 (1910.134-1998). Respiratory protection guidelines for Copper and Silver dusts (as may be generated during metal processing or during brazing) are provided as follows:

### NIOSH RECOMMENDATIONS FOR COPPER DUSTS AND MISTS (as Cu) CONCENTRATIONS IN AIR:

Up to 5 mg/m<sup>3</sup>: Dust and mist respirator.

Up to 10 mg/m<sup>3</sup>: Dust and mist respirator except single-use and quarter-mask respirator (if not present as a fume); or Supplied Air Respirator (SAR).

Up to 25 mg/m<sup>3</sup>: Powered air-purifying respirator with dust and mist filter(s); or SAR operated in a continuous-flow mode.

Up to 50 mg/m<sup>3</sup>: Full-facepiece respirator with high-efficiency particulate filter(s); or full-facepiece Self-Contained Breathing Apparatus (SCBA); or full-facepiece SAR; or powered air-purifying respirator with tight-fitting facepiece and high-efficiency particulate filter.

Up to 100 mg/m<sup>3</sup>: Positive pressure, full-facepiece SAR.

Emergency or Planned Entry into Unknown Concentrations or IDLH Conditions: Positive pressure, full-facepiece SCBA; or positive pressure, full-facepiece SAR with an auxiliary positive pressure SCBA.

Escape: Full-facepiece respirator with high-efficiency particulate filter(s); or escape-type SCBA.

### NIOSH/OSHA RECOMMENDATIONS FOR SILVER (METAL DUST AND SOLUBLE COMPOUNDS, AS SILVER) CONCENTRATIONS IN AIR:

Up to 0.25 mg/m<sup>3</sup>: Supplied Air Respirator (SAR) operated in a continuous-flow mode or powered air-purifying respirator with high-efficiency particulate filter.

Up to 0.5 mg/m<sup>3</sup>: Full-facepiece respirator with high-efficiency particulate filter(s), full-facepiece Self-Contained Breathing Apparatus (SCBA), or full-facepiece SAR.

Up to 10 mg/m<sup>3</sup>: Positive pressure, full-facepiece SAR.

Emergency or Planned Entry into Unknown Concentrations or IDLH Conditions: Positive pressure, full-facepiece SCBA or positive pressure, full-facepiece SAR with an auxiliary positive pressure SCBA.

Escape: Full-facepiece respirator with high-efficiency particulate filter(s) or escape-type SCBA.

**EYE PROTECTION:** Safety glasses. 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.

**HAND PROTECTION:** Wear gloves for routine industrial use. When these products are used in conjunction with brazing, it is recommended that gloves that protect from sparks and flame (per ANSI Z49.1-1988, “Safety in Welding and Cutting”) be worn.

**BODY PROTECTION:** Use body protection appropriate for task.



## 9. PHYSICAL and CHEMICAL PROPERTIES

The following information is for Copper, the main component of this product:

**RELATIVE VAPOR DENSITY (air = 1):** Not applicable.

**SPECIFIC GRAVITY (water = 1):** 8.94

**SOLUBILITY IN WATER:** Insoluble.

**VAPOR PRESSURE, mm Hg @ 20°C:** Not applicable.

**ODOR THRESHOLD:** Not applicable.

**COEFFICIENT OF OIL/WATER DISTRIBUTION (PARTITION COEFFICIENT):** Not applicable.

The following information is for the product:

**APPEARANCE AND COLOR:** These products consist of metallic-copper wire and rods with no odor, which may have a flux coating.

**EVAPORATION RATE (nBuAc = 1):** Not applicable.

**FREEZING/MELTING POINT:** 1083°C (1981°F)

**pH:** Not applicable.

**BOILING POINT:** 2595°C (4703°F)

**HOW TO DETECT THIS SUBSTANCE (warning properties):** The appearance is a distinctive characteristic of these products.

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## **10. STABILITY and REACTIVITY**

**STABILITY:** Stable.

**DECOMPOSITION PRODUCTS:** Thermal decomposition may produce copper, phosphorous, and silver compounds and a variety of metal oxides.

**MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE:** Strong acids, oxidizers, halogens, and acid chlorides.

**HAZARDOUS POLYMERIZATION:** Will not occur.

**CONDITIONS TO AVOID:** Uncontrolled exposure to extreme temperatures, incompatible materials.

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## **11. TOXICOLOGICAL INFORMATION**

**TOXICITY DATA:** Presented below are human toxicological data available for the components of these products. Other data for animals are available for the components of these products, but are not presented in this Material Safety Data Sheet.

### **BORIC ACID:**

Skin Irritancy (human) = 15 mg/ 3 days/ intermittent; mild  
LD (oral, human) = 37 mg/kg/ boron as boric acid  
LD (skin, infant) = 210 mg/kg/ boron as boric acid  
TDLo (oral, rat) = 45000 mg/kg/ 90 days/ male; reproductive effects  
TDLo (oral, child) = 500 mg/kg; gastrointestinal effects  
LDLo (oral, man) = 429 mg/kg; cardiovascular, systemic effects  
LDLo (oral, woman) = 200 mg/kg  
TDLo (oral, infant) = 800 mg/kg/ 4 weeks/ intermittent  
LDLo (oral, infant) = 934 mg/kg  
LDLo (skin, infant) = 1200 mg/kg  
LDLo (skin, child) = 4000 mg/kg/ 4 days  
LDLo (skin, man) = 2430 mg/kg  
LDLo (skin, child) = 1500 mg/kg  
LDLo (subcutaneous, infant) = 1100 mg/kg  
TDLo (unreported, man) = 170 mg/kg; gastrointestinal effects  
LDLo (unreported, man) = 147 mg/kg

### **COPPER:**

TDLo (oral, human) = 120 µg/kg; gastrointestinal tract effects

### **SILVER:**

TCLo (inhalation, human) = 1 mg/m<sup>3</sup>; skin effects

### **PHOSPHOROUS:**

LDLo (unreported, man) = 4412 µg/kg

**SUSPECTED CANCER AGENT:** The components of this product are listed as follows:

**COPPER:** EPA-D (Not Classifiable as to Human Carcinogenicity)

**SILVER:** EPA-D (Not Classifiable as to Human Carcinogenicity)

**PHOSPHOROUS:** EPA-D (Not Classifiable as to Human Carcinogenicity)

**PROPRIETARY FLUORIDE COMPOUND (as a Fluoride Compound):** IARC-3 (Unclassifiable as to Carcinogenicity in Humans), ACGIH TLV-A4 (Not Classifiable as a Human Carcinogen)

The other components of these products are not found on the following lists: FEDERAL, OSHA Z LIST, NTP, IARC and CAL/OSHA and therefore are neither considered to be nor suspected to be cancer-causing agents by these agencies.

**IRRITANCY OF PRODUCT:** Dusts or fumes of this product may be irritating to contaminated skin and eyes. Fumes may be irritating to the respiratory system.

**SENSITIZATION TO THE PRODUCT:** Rare cases of allergic contact dermatitis have been reported in people working with copper dust.

**REPRODUCTIVE TOXICITY INFORMATION:** Listed below is information concerning the effects of these products and their components on the human reproductive system.

**Mutagenicity:** These products are not reported to produce mutagenic effects in humans. Animal mutation data is available for Boric Acid (constituent of flux coated products); this data was obtained during clinical studies on specific animal tissues exposed to high doses of this compound.

**Embryotoxicity:** These products are not reported to produce embryotoxic effects in humans.

**Teratogenicity:** These products are not reported to cause teratogenic effects in humans. Studies on test animals exposed to relatively high doses of Copper (a component of this product) indicate adverse teratogenic effects.

**Reproductive Toxicity:** These products are not reported to cause reproductive effects in humans. Studies on test animals exposed to relatively high doses of Boric Acid and Copper (components of some of these products) indicate adverse reproductive effects.

*A **mutagen** is a chemical, which causes permanent changes to genetic material (DNA) such that the changes will propagate through generational lines. An **embryotoxin** is a chemical, which causes damage to a developing embryo (i.e. within the first eight*

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weeks of pregnancy in humans), but the damage does not propagate across generational lines. A teratogen is a chemical, which causes damage to a developing fetus, but the damage does not propagate across generational lines. A reproductive toxin is any substance, which interferes in any way with the reproductive process.

Currently, there are Biological Exposure Indices (BEIs) determined for the Fluoride Compound component of the Flux Coating (as a Fluoride).

BIOLOGICAL EXPOSURE INDICES (BEIs) for components of these products are as follows:		
CHEMICAL: DETERMINANT	SAMPLING TIME	BEI
FLUORIDES: Fluorides in urine	Prior to shift End of shift	3 mg/g creatinine 10 mg/g creatinine

## 12. ECOLOGICAL INFORMATION

ALL WORK PRACTICES MUST BE AIMED AT ELIMINATING ENVIRONMENTAL CONTAMINATION.

**ENVIRONMENTAL STABILITY:** The components of these products occur naturally in the environment and are expected to persist in the environment for an extended period of time. The components will react with water and air to form a variety of metal oxide compounds. The following environmental data are available for the components of these products.

**BORIC ACID:** Water solubility = 1 g/ 18 mL (cold), 1 g/ 4 mL (boiling).

**SILVER:** Solubility: Insoluble. Many silver salts are only slightly soluble and so silver cations will rapidly be reduced to lower levels. The Biological half-life for silver is a few days for animals and up to 50 days for humans.

**COPPER:** Solubility: Insoluble. There is no evidence of any biotransformation for copper compounds. Copper is accumulated by all plants and animals. BCF Algae = 12; plants = 1,000; invertebrate = 1,000, fish = 667 and fish =200(Soluble copper salts).

**PHOSPHOROUS:** Solubility in water 1 part/300,000 parts water. Radioactive phosphorous has been concentrated by factors of 75,000 by waterfowl and 850,000 by aquatic life.

**TIN:** Solubility: Insoluble in water.

**EFFECT OF MATERIAL ON PLANTS or ANIMALS:** Animal studies on copper indicate various health effects after ingestion and exposures. Specific data on test animals are available, but are not presented in this Material Safety Data Sheet.

**EFFECT OF CHEMICAL ON AQUATIC LIFE:** These products are expected to cause adverse effects on aquatic life. Low chronic aquatic limits indicate a high chronic hazard; it may be concentrated to toxic levels in food chain. The following aquatic toxicity data are available for the components:

**BORIC ACID:**

LC<sub>50</sub> (trout eggs) = 100 ppm/ soft

LC<sub>50</sub> (trout eggs) = 79 ppm/ hard

LC<sub>50</sub> (catfish eggs) = 155 ppm/ soft

LC<sub>50</sub> (catfish eggs) = 22 ppm/ hard

LC<sub>50</sub> (goldfish eggs) = 46 ppm/ soft

LC<sub>50</sub> (goldfish eggs) = 75 ppm/ hard

LC<sub>50</sub> (*Daphnia magna*) = 133 mg/L/ 48 hours

**COPPER:**

LC<sub>50</sub>(fathead minnows) = 0.14 ppm in hard water

LC<sub>50</sub>(bluegill) = 0.02 ppm in soft water

LC<sub>50</sub>(brook trout) = 0.09 ppm in soft water

**SILVER:** 0.1 ppm is toxic to bacteria and aquatic life. Discharge into marine waters should not exceed /20 of 96 hour LC50, 0.25-0.025 mg/kg/day.

## 13. DISPOSAL CONSIDERATIONS

**PREPARING WASTES FOR DISPOSAL:** Waste disposal must be in accordance with appropriate Government, State, and local regulations. These products, if unaltered by use, may be disposed of by treatment at a permitted facility or as advised by your local hazardous waste regulatory authority.

**EPA WASTE NUMBER:** Waste of these products should be analyzed for Toxicity Characteristic Leaching Procedure chemicals, as follows: D011 (Silver), Regulated Level: 5.0 mg/L.

## 14. TRANSPORTATION INFORMATION

THIS MATERIAL IS NOT HAZARDOUS (Per 49 CFR 172.101) BY THE U.S. DEPARTMENT OF TRANSPORTATION.

**PROPER SHIPPING NAME:** Not applicable.

**HAZARD CLASS NUMBER and DESCRIPTION:** Not applicable.

**UN IDENTIFICATION NUMBER:** Not applicable.

**PACKING GROUP:** Not applicable.

**DOT LABEL(S) REQUIRED:** Not applicable.



## **15. REGULATORY INFORMATION**

**Product Name:** **PHOS/COPPER BRAZING ALLOYS**

Refer to the Australian Inventory of Chemical Substances – AICS at <https://www.nicnas.gov.au/chemicals-on-AICS#main>

**Poison schedule:** Classified as a Schedule 6 (S6) Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP). <https://www.legislation.gov.au/Details/F2016L01638>

**Classifications:** Safework Australia criteria is based on the Globally Harmonised System (GHS) of Classification and Labelling of Chemicals.

The classifications and phrases listed below are based on the Approved Criteria for Classifying Hazardous Substances [NOHSC: 1008(2004)].

## **16. OTHER INFORMATION**

### **References**

Preparation of Safety Data Sheets for Hazardous Chemicals Code of Practice

Standard for the Uniform Scheduling of Medicines and Poisons

Australian Code for the Transport of Dangerous Goods by Road & Rail.

Modell Work Health and Safety Regulations, Schedule 10: Prohibited carcinogens, restricted carcinogens and restricted hazardous chemicals.

Workplace exposure standards for airborne contaminants, Safe work, Australia

American Conference of Industrial Hygienists (ACGIH)

Globally Harmonised System of classification and labelling of chemicals.

**WELDING (1):** Due to the diversity of welding techniques, processes, materials used, nature of the surface being welded and the presence of contaminants, the fumes & gases associated with welding will vary in composition and quantity. When assessing a welding process, the toxic fumes generated may not only be associated with the parent metal, filler wire or electrode. The welding/cutting arc may generate nitrogen oxides, carbon monoxide & other gases, whilst UV radiation emitted from some arcs generates ozone. Ozone may irritate mucous membranes and cause pulmonary oedema & haemorrhage. Shielding gases (e.g. carbon dioxide and inert gases i.e. argon and helium) in high concentrations, in confined spaces, may reduce oxygen in the atmosphere to dangerous levels, resulting in possible asphyxiation.

**WELDING (2):** In addition to complying with individual exposure standards for specific contaminants, where current manual welding processes are used, the fume concentration inside the welder's helmet should not exceed 5 mg/m<sup>3</sup> ( unless otherwise classified) when collected in accordance with Australian Standard AS 3853.1: Fume from welding and allied processes - Guide to methods for the sampling and analysis of particulate matter and AS 3853.2: Fume from welding and allied processes - Guide to methods for the sampling and analysis of gases. Airway irritation and metal fume fever are the most common acute effects from welding fumes. Reported to cause reduced sperm quality in welders.

**WELDING (3):** Other gases and fumes associated with welding processes include: Inert shielding gases (e.g. argon, carbon dioxide, helium) which may reduce the atmospheric oxygen content in poorly ventilated areas. UV-radiation and Infra-Red radiation may decompose chlorinated degreasing agents to form highly toxic and irritating phosgene gas. This may occur if a metal has been degreased but inadequately dried or when vapours from a nearby degreasing bath enter the welding zone.

**WELDING (4):** Welding fumes may contain a wide variety of chemical contaminants, including oxides and salts of metals and other compounds which may be generated from electrodes, filler wire, flux materials and from the welded material (e.g. painted surfaces). Welding stainless-steel and its alloys generates nickel and chromium (VI) compounds. Welding fumes are retained in the lungs. Sparingly soluble compounds may be released slowly from the lungs. Welding fume is classified as possibly carcinogenic to humans (IARC Group 2B).

**PERSONAL PROTECTIVE EQUIPMENT GUIDELINES:**

The recommendation for protective equipment contained within this report is provided as a guide only. Factors such as method of application, working environment, quantity used, product concentration and the availability of engineering controls should be considered before final selection of personal protective equipment is made.

**Disclaimer:**

We urge each end user and recipient of this SDS to study it carefully. If necessary, consult an industrial hygienist or other expert to understand this information and safeguard the environment and protect workers from potential hazards associated with the handling or use of this product.

Harris Products Group cannot anticipate all conditions under which this information and its product, or the products of other manufacturers in combination with its product, may be used. It is the user's responsibility to ensure safe conditions for use, handling, storage and disposal of the product, and to assume liability for loss, injury, damage or expense due to improper use. The information in the sheet was written based on the best knowledge and experience currently available.

[ End of SDS ]

