Reviewed on 06/04/2022

Safety Data Sheet

1 IDENTIFICATION

Product identifier

Trade name: Phosphorus/Copper Brazing Filler Metal
Product size: Variable

Other means of identification: Harris 0, Harris 0 LP, Harris 0 HP, Harris 0 AM, Harris 0 HHP, Harris 0HP, Harris 0 XHP, LCuP6, LCuP7, Phoson, PSN 4, Flash, LCuP8 (Chemical characterization: Mixtures = Table 1)
Blockade - Bare & Flux Coated (Chemical characterization: Mixtures = Table 2)
Stay-Silv. 2, 5, 15, 45, 56 (Bare Silver), 45%, 56% (Flux Coated). (Chemical characterization: Mixtures = Table 3)

SDS Number: 0086

Recommended use and restriction on use
Recommended use: Metal Brazing
Restrictions on use: No further relevant information available.

Manufacturer/Importer/Supplier/Distributor information
Importer:
NEW ZEALAND
Harris Products Group
Unit 16, 232 Ellis St
Frankton, Hamilton
New Zealand 3204
(06) 83405875
Safety Data Sheet Questions: sales@harrisnz.com
Website: http://www.harrisproductsgroup.co.nz

New Zealand National Poisons Centre/Helpline (24 hours) 0800 POISON (0800 764 766)
Fire Service - Ambulance – 111

AUSTRALIA
Harris Products Group
14 Queensland Rd
Darra, QLD, Australia 4076
(07) 33753670
Safety Data Sheet Questions: sales@hgea.com.au
Website: http://www.harrisproductsgroup.com.au

2 HAZARD(S) IDENTIFICATION

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.

HAZARDOUS CHEMICAL. NON-DANGEROUSE GOODS. According to the WHS Regulations and the ADG Code.
HAZAD RATINGS

Flammability	0
Toxicity	2

(Contd. on page 2)

0 = Minimum
1 = Low
2 = Moderate
3 = High
4 = Extreme

Body Contact	3
Reactivity	0
Chronic	

Label Elements
GHS label elements



Skin Sensitiser **Organ Toxicity** **Aquatic Hazard**

Signal Word **WARNING**

Precautionary Statement
H317 May cause an allergic skin reaction
H351 Suspected of causing cancer
H373 May damage organs
H410 Very toxic to aquatic life

Prevention
P201 Obtain special instructions before use.
P260 Do not breath in dust, gas, mist, fumes, vapours, sprays
P280 Wear face protection, protective gloves and clothing, eye protection.
P281 Use protective equipment as needed.

Response
P308 If concerned about exposure: Get medical advice
P363 Wash contaminated protective clothing before using again
P302 If contact with skin: wash with soap and water
P314 If feel unwell: get medical advice

Storage
P405 Lock up storage

Disposal
P501 Dispose in accordance with local authority regulations

Additional information:
Other hazards which do not result in GHS classification:
Heat rays (infrared radiation) from flame or hot metal can injure eyes. Overexposure to brazing fumes and gases can be hazardous. Read and understand the manufacturer's instructions, Safety Data Sheets and the precautionary labels before using this product.

3 Composition/information on ingredients

Chemical characterization: Mixtures
Description: Mixture: consisting of the following components.

Dangerous components: Table 1		
CAS	Name	Proportion
7440-50-8	Copper	92-94%
7723-14-0	Phosphorous	6-8%
Dangerous components: Blockade Table 2		
CAS	Name	Proportion
7440-50-8	Copper	84-89%
7723-14-0	Phosphorus	5-9%

(Contd. on page 3)

7440-31-5	Tin	6-7%
Dangerous components: Stay-Silv Table 3		
CAS	Name	Proportion
7440-50-8	Alloy comprising copper	10-60%
7440-2204	silver	10-60%
7440-31-5	tin	0-20%
7440-66-6	zinc	10-60%
7440-02-0	nickel	<10%
7440-21-3	silicon	0-1%
Flux Coating on Rods including Blockade		
10043-3-3	Boric Acid	Not Established
7789-75-5	Proprietary fluoride compound	Not Established
Proprietary	Methacrylate/aliphatic compound	Not Established
7732-18-5	Water	Not Established
In Use Generate Welding Fumes		
7440-50-8	Copper fume	Not Available
1314-13-2	Zinc oxide fume	Not Available
7440-02-0	Nickel fume	Not Available

Additional information:
For the listed ingredient(s), the identity and exact percentage(s) are being withheld as a trade secret.
Composition comments:
The term “Hazard Ingredients” should be interpreted as a term defined in Hazard Communication standards and does not necessarily imply the existence of a hazard. The product may contain additional nonhazardous ingredients or may form additional compounds under the condition of use. Refer to Sections 2 and 8 for more information.

4 First-aid measures

Skin Exposure
If dusts or particulates generated by the flux coating on the flux coated products or fumes generated by brazing operations involving these products 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 dusts or particulates generated by the flux coating on the flux coated products or fumes generated by brazing operations involving these products 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 dusts or particulates generated by the flux coating on the flux coated products or fumes generated by brazing operations involving these products are inhaled, remove victim to fresh air. If necessary, use artificial respiration to support vital functions.
Ingestion
If swallowed do not induce vomiting and 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 from exposure
Skin, respiratory, and kidney disorders may be aggravated by prolonged over-exposures to the dusts or fumes generated by these products.
Recommendations to physicians

(Contd. on page 4)

Treat symptoms and eliminate overexposure. Call for medical aid. Employ first aid techniques recommended by the Australian Red Cross

Indication of any immediate medical attention and special treatment needed: Treat symptomatically.

5 Fire-fighting measures

Extinguishing media
Suitable extinguishing agents:
As shipped, the product will not burn. In case of fire in the surroundings: use appropriate extinguishing agent.
For metal fires: Use specific agents only.

For safety reasons unsuitable extinguishing agents: For metal fires: Use specific agents only.

Special hazards arising from the substance or mixture
Infrared radiation from flame or hot metal can ignite combustibles and flammable products.

Advice for firefighters
Special fire fighting procedures:
Use standard firefighting procedures and consider the hazards of other involved materials.

Protective equipment:
Wear self-contained respiratory protective device.
Wear fully protective suit.

Additional information
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.)

6 Accidental release measures

Personal precautions, protective equipment and emergency procedures
If airborne dust and/or fume is present, use adequate engineering controls and, if needed, personal protection to prevent overexposure. Refer to recommendations in Section 8.

Environmental precautions:
Avoid release to the environment.
Prevent further leakage or spillage if safe to do so.

Methods and material for containment and cleaning up:
Clean up spills immediately, observing precautions in the personal protective equipment in Section 8. Avoid generating dust. Prevent product from entering any drains, sewers or water sources. (Continued on Page 4)
Pick up mechanically.
Send for recovery or disposal in suitable receptacles.
Dispose contaminated material as waste according to item 13.

Reference to other sections
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

(Contd. on page 5)

7 Handling and storage

Handling:
Precautions for safe handling
Avoid breathing dust.
Ensure good ventilation/exhaustion at the workplace.
Any deposit of dust which cannot be avoided must be regularly removed.
Read and understand the manufacturer's instruction and the precautionary label on the product. Refer to Lincoln Safety Publications at www.lincolnelectric.com/safety. See the Australian Standard - AS 1674.1 – 1997 – Reconfirmed 2016. Safety in Welding and Allied Processes Australia.

Information about protection against explosions and fires: No special measures required.

Conditions for safe storage, including any incompatibilities
Storage:
Requirements to be met by storerooms and receptacles:
Store in closed original container in a dry place. Store away from incompatible materials. Store in accordance with local/regional/national regulations.

Information about storage in one common storage facility: No special requirements.

Further information about storage conditions: No special requirements.

Specific end use(s) No further relevant information available.

8 Exposure controls/personal protection

Additional information about design of technical systems: No further data; see item 7.

Control parameters
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.
The American Governmental Congress of Industrial Hygienists (ACGIH) however recommends a Threshold Limit Value (TLV) Time Weighted Average (TWA) of 5 mg/m^3 for welding fume, on the assumption that there are no highly toxic constituents.; However, in Australia, there is no specific exposure standard for welding fume This is due to the fume being a combination of the metals and filler material being molten together along with cleaning and fluxing agents present. Each metal or material within the process of welding will generally have its own exposure standard. (Continued on Page 5).

CAS	Ingredient	TWA mg/m^3
7440-50-8	Copper - Fume	TWA 0.2 mg/m^3
7440-50-8	Copper – Dusts & Mists	TWA 1 mg/m^3
7723-14-0	Phosphorous	TWA 0.1 mg/m^3

Source	**Material**	**TWA mg/m^3**	**STEL mg/m^3**
Australia Exposure Standards	Copper (dust, mists Cu)	1	
Australia Exposure Standards	Copper (fume)	0.2	

(Contd. on page 6)

Australia Exposure Standards	Copper (inspirable dust) not otherwise classified	10	
Australia Exposure Standards	Silver (Silver metal)	0.01	
Australia Exposure Standards	Tin (tin, metal)	2	
Australia Exposure Standards	Silicon (silicon (a))	10	
Source	**Material**	**TWA mg/m³**	**STEL mg/m³**
Australia Exposure Standards	Welding fumes (not otherwise classified)	5	
Australia Exposure Standards	Zinc oxide fume	5	10

Refer to Worksafe Australia for standards:
http://www.safeworkaustralia.gov.au/sites/SWA/about/Publications/Documents/639/Workplace_Exposure_Standards_for_Airborne_Contaminants.pdf

Exposure controls
Personal protective equipment:
General protective and hygienic measures:
The usual precautionary measures for handling chemicals should be followed.
Do not eat, drink or smoke when using the product. 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.

Determine the composition and quantity of fumes and gases to which workers are exposed by taking an air sample from inside the welder's helmet if worn or in the worker's breathing zone. Improve ventilation if exposures are not below limits. Personal air monitoring is generally undertaken over a representative period of time undertaken to Australian Standard AS 3640-2009 Workplace atmospheres – Method for sampling and gravimetric determination of inhalable dust using IOM sampling heads with flow rate of 2.0 L/min.
Keep away from foodstuffs, beverages and feed.

Engineering Controls
Copper Dusts and Mists:
50 mg/m³ or less – A high efficiency particulate filter respirator with a full face piece or an supplied air respirator.

2000 mg/m³ or less – A type C supplied air respirator with full face piece operated in pressure demand mode.
Greater than 2000 mg/m³ or entry and escape from unknown concentrations – Self contained breathing apparatus with full face piece operated in pressure demand or other positive pressure mode.
Silver Exposure- Ventilation is recommended for controlling dust exposures including for silver. Appropriate administrative controls should also be used to ensure adequate maintenance for the ventilation system. Housekeeping policies should also be developed and used for further dust suppression and surface decontamination. With regard to silver metal overexposures between 0.01 mg/ operators must use engineering controls to reduce exposure to the permissible limit. As silver can cause eye and skin irritation, it is recommended that workers also where appropriate eye and skin protection compatible with the respirator.

0.25mg/m³ – Supplied air operated respirator in continuous flow mode.
0.50mg/m³ – Air purifying full face piece with tight fitting face piece operated in continuous flow mode.
10mg/m³ – Supplied air operated in pressure demand full fitting face piece.

Tin
2mg/m³ - Whenever possible the use of local exhaust ventilation or other engineering controls is the preferred method of controlling exposure to airborne dust and fume to meet established occupational exposure limits. Use good housekeeping and sanitation practices. Do not use tobacco or food in work area. Wash thoroughly before eating or smoking. Do not blow dust off clothing or skin with compressed air.

Silicon
5 mg/m³ - Silicon dust appears to have little adverse effect on the lungs and is not implicated in the genesis of

(Contd. on page 7)

organic disease or in the production of toxic effects.
For aluminium oxide and pyrophoric grades of aluminium: Twenty-seven-year experience with aluminium oxide dust (particle size 96% 1,2 um) without adverse effects either systemically or on the lung, and at a calculated concentration equivalent to 2 mg/m^3 over an 8-hour shift has led to the current recommendation of the TLV-TWA. The limit should also apply to aluminium pyro powders whose toxicity is reportedly greater than aluminium dusts and should be protective against lung changes. For aluminium oxide: The experimental and clinical data indicate that aluminium oxide acts as an "inert" material when inhaled and seems to have little effect on the lungs nor does it produce significant organic disease or toxic effects when exposures are kept under reasonable control. The concentration of dust, for application of respirable dust limits, is to be determined from the fraction that penetrates a separator whose size collection efficiency is described by a cumulative log-normal function with a median aerodynamic diameter of 4.0 µm (+-) 0.3 µm and with a geometric standard deviation of 1.5 µm (+-) 0.1 µm, i.e. Generally, less than 5 µm.

Zinc Oxide Fumes - Zinc oxide intoxication is characterised by general depression, shivering, headache, thirst, colic and diarrhoea. Exposure to the fume may produce metal fume fever characterised by chills, muscular pain, nausea and vomiting.
Welding Fumes - Local exhaust ventilation systems should be designed to provide a minimum capture velocity at the fume source of 0.5m/second away from the welder. Inlets and outlets should be kept clear at all times. Air from a local exhaust ventilation system should not be re-circulated into the workroom. This air should be discharged into the outside air away from other work areas and away from air conditioning inlets or compressors supplying breathing air.
Examples of local exhaust ventilation suitable for welding operations include:
Fixed installations, such as side-draught or down-draught tables and benches, and partially or completely enclosed booths. Portable installations, such as movable hoods that are attached to edible ducts.
Low volume high velocity fume extractors attached directly to the welding gun.
Respiratory Protective Devices - Respirators should be fitted for each person individually and if one is to be used by another operator, it must be disinfected and re fitted before use. The tightness of all connections and the condition of the face piece, headbands and valves should be checked before each use. Air supplied respirators may be required in some situations, e.g. confined spaces. For further information, refer to: AS/NZS 1716: *Respiratory protective devices* and be selected in accordance with AS/NZS 1715: *Selection, use and maintenance of respiratory protective equipment.*
Breathing equipment:
Keep your head out of fumes. Use enough ventilation and local exhaust to keep fumes and gases from your breathing zone and the general area. An approved respirator should be used unless exposure assessments are below applicable exposure limits. Particulate mask should filter at least 99% of airborne particles.

Protection of hands:

Thermally-protective gloves.

Suitable gloves can be recommended by the glove supplier.
The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.

Eye protection:

Wear glasses or face shield with appropriate shading for brazing operations.
(Continued on page 6)

Body protection: Protective work clothing

Limitation and supervision of exposure into the environment No special requirements.

(Contd. on page 8)

Risk management measures No special requirements.

9 Physical and chemical properties

Information on basic physical and chemical properties
General Information
Appearance:

Form:	Solid material
Colour:	According to product specifications
Odour:	Odourless
Odour Threshold:	Not Determined
pH-value:	Not applicable

Change in condition

Melting point/Melting range:	618 - 830(C°)
Boiling point/Boiling range:	Undetermined

Flash point:	Not Applicable
Flammability (solid, gaseous):	Not Determined
Auto-ignition temperature:	Not Determined
Decomposition temperature:	Not Determined
Auto igniting:	Product is not self-igniting
Danger of explosion:	Product does not present and explosion hazard

Explosion Limits:

Lower:	Not Determined
Upper:	Not Determined

Vapour Pressure:	Not Applicable
Density:	8.94 (H20=1)
Relative Density:	Not Determined
Vapour Density:	Not Applicable
Evaporation Rate:	Not Applicable

Solubility in/Miscibility with water:	Insoluble
Partition coefficient (n-octanol/water:	Not Determined
Viscosity:	
Dynamic:	Not applicable
Kinematic:	Not applicable
Other Information:	No further relevant information available

10 Stability and reactivity

Reactivity: The product is non-reactive under normal conditions of use, storage and transport.

Chemical stability: Stable under normal temperatures and pressures.

Thermal decomposition / conditions to be avoided:
No decomposition if used and stored according to specifications.

Possibility of hazardous reactions
Reacts with strong acids and alkali.
Reacts with strong oxidizing agents.

Conditions to avoid: Avoid heat or contamination.

(Contd. on page 9)

Incompatible materials: No further relevant information available.

Hazardous decomposition products:
Brazing fumes and gases cannot be classified simply. The composition and products: quantity of both are dependent upon the metal being joined, the process, procedure and filler metals and flux used. Other conditions which also influence the composition and quantity of the fumes and gases to which workers may be exposed include: coatings on the metal being joined (such as paint, plating, or galvanizing), the number of operators and the volume of the worker area, the quality and amount of ventilation, the position of the operator's head with respect to the fume and fumes from chemical fluxes used in some brazing operations. When the wire or rod is consumed, the fume and gas decomposition products generated are different in percent and form from the ingredients listed in Section 3. Decomposition products of normal operation include those originating from the volatilization, reaction, or oxidation of the materials shown in Section 3, plus those from the base metal and coating, etc., as noted above.

11 Toxicological information

Information on likely routes of exposure
Acute Toxicity
Ingestion:
Unlikely route of exposure.
Soluble zinc salts produce irritation and corrosion of the alimentary tract (in a manner similar to copper salts) with pain, vomiting, etc. Delayed deaths have been ascribed to inanition (weakness and extreme weight loss resulting from prolonged and severe food insufficiency) following severe strictures of the oesophagus, and pylorus. Vomiting, abdominal cramps, and diarrhoea, in several cases with blood, have been observed after ingestion of zinc sulphate. Several cases of gastrointestinal disturbances have been reported after ingestion of zinc sulphate. A significant reduction in erythrocyte superoxide dismutase activity (47% decrease), haematocrit, and serum ferritin, compared to pre-treatment levels, occurred in female subjects who received supplements (as capsules) of 50 mg zinc/day as zinc gluconate for 10 weeks.
Numerous cases of a single oral exposure to high levels of copper have been reported. Consumption of copper-contaminated drinking water has been associated with mainly gastrointestinal symptoms including nausea, abdominal pain, vomiting and diarrhoea. A metallic taste, nausea, vomiting and epigastric burning often occur after ingestion of copper and its derivatives. The vomitus is usually green/blue and discolours contaminated skin.
Accidental ingestion of the material may be damaging to the health of the individual.

Inhalation:
Inhalation of fume may aggravate a pre-existing respiratory condition such as asthma, bronchitis, emphysema.
Copper poisoning following exposure to copper dusts and fume may result in headache, cold sweat and weak pulse. Capillary, kidney, liver and brain damage are the longer term manifestations of such poisoning.
Inhalation of vapours or aerosols (mists, fumes), generated by the material during the course of normal handling, may be damaging to the health of the individual.
There is some evidence to suggest that the material can cause respiratory irritation in some persons. The body's response to such irritation can cause further lung damage.
Inhalation hazard is increased at higher temperatures.
Inhalation of freshly formed zinc oxide particles sized below 1.5 microns and generally between 0.02 to 0.05 microns may result in "metal fume fever", with symptoms resembling influenza. Symptoms may be delayed for up to 12 hours and begin with the sudden onset of thirst, and a sweet, metallic or foul taste in the mouth.
Regular exposure to nickel fume, as the oxide, may result in "metal fume fever" a sometimes debilitating upper respiratory tract condition resembling influenza.
Symptoms include malaise, fever, weakness, nausea and may appear quickly if operations occur in closed or poorly ventilated areas.
Inhalation of freshly formed metal oxide particles sized below 1.5 microns and generally between 0.02 to 0.05 microns may result in "metal fume fever".

(Contd. on page 10)

Skin Contact: Exposure to copper, by skin, has come from its use in pigments, ointments, ornaments, jewellery, dental amalgams and IUDs (intra-uterine devices), and in killing fungi and algae. Although copper is used in the treatment of water in swimming pools and reservoirs, there are no reports of toxicity from these applications. Reports of allergic contact dermatitis following contact with copper and its salts have appeared in the literature, however the exposure concentrations leading to any effect have been poorly characterized. In studies, the possible contamination with nickel (which causes allergies definitely) has been raised as a reason for any reactions observed.
(Contd. on page 10)
Entry into the blood-stream, via for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.
There is some evidence to suggest that the material may cause mild but significant inflammation of the skin either following direct contact or after a delay of some time. Repeated exposure can cause contact dermatitis which is characterised by redness, swelling and blistering.
Skin contact with the material may be harmful; systemic effects may result following absorption.

Eye Contact: Copper salts, in contact with the eye, may produce inflammation of the conjunctiva, or even ulceration and cloudiness of the cornea. If applied to the eyes, this material causes severe eye damage.

CHRONIC HEALTH EFFECTS
Principal routes of exposure include accidental contact with the molten metal and inhalation of fume arising as a consequence
of the action of the flame on the rod / wire. Although fume generation rates are generally low, excessive heating of the material, well above its quoted melting point, may result in over-exposure.
Harmful: danger of serious damage to health by prolonged exposure through inhalation.
There has been concern that this material can cause cancer or mutations, but there is not enough data to make an assessment. Skin contact with the material is more likely to cause a sensitisation reaction in some persons compared to the general
population.
Copper has fairly low toxicity. Some rare hereditary conditions (Wilson disease or hepatolenticular degeneration) can lead to accumulation of copper on exposure, causing irreversible damage to a variety of organs (liver, kidney, CNS, bone, vision) and
lead to death. There may be anaemia and cirrhosis of the liver.
Metallic dusts generated by the industrial process give rise to a number of potential health problems. The larger particles,
above 5 micron, are nose and throat irritants. Smaller particles however, may cause lung deterioration. Particles of less than
1.5 micron can be trapped in the lungs and, dependent on the nature of the particle, may give rise to further serious health consequences.

Additional toxicological information:
Organic polymers may be used in the manufacture of various welding consumables. Overexposure to their decomposition by products may result in a condition known as polymer fume fever.
Polymer fume fever usually occurs within 4 to 8 hours of exposure with the presentation of flu like symptoms, including mild pulmonary irritation with or without an increase in body temperature. Signs of exposure can include an increase in white blood cell count. Resolution of symptoms typically occurs quickly, usually not lasting longer than 48 hours.

Acute effects (acute toxicity, irritation and corrosivity):
Harmful if swallowed.
Causes serious eye damage.
Irritating to skin.

Repeated Dose Toxicity: Danger of very serious irreversible effects.

Germ cell mutagenicity Based on available data, the classification criteria are not met.
Carcinogenicity Based on available data, the classification criteria are not met.
Reproductive toxicity Based on available data, the classification criteria are not met.

(Contd. on page 11)

STOT-single exposure Based on available data, the classification criteria are not met.
STOT-repeated exposure Causes damage to the respiratory system through prolonged or repeated exposure.
Route of exposure: Inhalation.
Aspiration hazard Based on available data, the classification criteria are not met.

Acute toxicity:
LD/LC50 values that are relevant for classification:

CHEMICAL	TOXICITY	IRRITATION
Brazing Alloys	Not Available	Not Available
Copper	Dermal (rat) LD50: >2000 mg/kg [1 Inhalation (rat) LC50: 0.733 mg/l/4hr [1] Inhalation (rat) LC50: 1.03 mg/l/4hr [1] Inhalation (rat) LC50: 1.67 mg/l/4hr [1] Oral (rat) LD50: 300-500 mg/kg[1]	Nil Reported
Nickel	Oral (rat) LD50: 5000 mg/kg[2]	Not Available
Zinc	Dermal (rabbit) LD50: 1130 mg/kg[2] Oral (rat) LD50: >2000 mg/kg[1]	Not Available
Tin	Dermal (rat) LD50: >2000 mg/kg[1] Oral (rat) LD50: >2000 mg/kg[1]	Not Available
Sliver	Oral (rat) LD50: >2000 mg/kg[1]	Not Available
Silicon	Dermal (rabbit) LD50: >5000 mg/kg[1] Oral (rat) LD50: 3160 mg/kg[2]	Nil Reported

Fumes

Nickel Fumes	Oral (rat) LD50: 5000 mg/kg[2]	Not Available
Welding Fumes	Not Available	Not Available
Copper Fumes	Dermal (rat) LD50: >2000 mg/kg [1 Inhalation (rat) LC50: 0.733 mg/l/4hr [1] Inhalation (rat) LC50: 1.03 mg/l/4hr [1] Inhalation (rat) LC50: 1.67 mg/l/4hr [1] Oral (rat) LD50: 300-500 mg/kg[1]	Not Available
Zinc Oxide Fumes	Oral (rat) LD50: >5000 mg/kg [1]	Eye (rabbit): 500 mg/24h Mild Skin (rabbit): 500 mg/24h Mild

Additional toxicological information:
Organic polymers may be used in the manufacture of various welding consumables. Overexposure to their decomposition by products may result in a condition known as polymer fume fever.
Polymer fume fever usually occurs within 4 to 8 hours of exposure with the presentation of flu like symptoms, including mild pulmonary irritation with or without an increase in body temperature. Signs of exposure can include an increase in white blood cell count. Resolution of symptoms typically occurs quickly, usually not lasting longer than 48 hours.
The product is not subject to classification according to internally approved calculation methods for preparations:
When used and handled according to specifications, the product does not have any harmful effects according to our experience and the information provided to us.

Carcinogenic categories
IARC (International Agency for Research on Cancer)
None of the ingredients is listed.

NTP (National Toxicology Program)
None of the ingredients is listed.

OSHA-Ca (Occupational Safety & Health Administration)
None of the ingredients is listed.

(Contd. on page 12)

Other information relevant to carcinogenicity
Cancerous lesions have been reported in persons exposed to arc rays.
Germ cell mutagenicity Based on available data, the classification criteria are not met.
Carcinogenicity Based on available data, the classification criteria are not met.
Reproductive toxicity May cause harm to breast-fed children.
STOT-single exposure Based on available data, the classification criteria are not met.
STOT-repeated exposure Causes damage to the respiratory system through prolonged or repeated exposure.
Route of exposure: Inhalation.
Aspiration hazard Based on available data, the classification criteria are not met.

12 Ecological information

Ingredient	96 hr LC50 Fish, mg/l	48 hr EC50 Crustacea, mg/l	ErC50 Algae, mg/l
Copper - (7440-50-8)	0.0103, Pimephales promelas	0.0025, Daphnia magna	0.018 (72 hr), Pseudokirchneriella subcapitata
Zinc – (7440-66-6)	0.182, Oncorhynchus tshawytscha	0.068, Daphnia magna	0.106 (72 hr), Pseudokirchneriella subcapitata
Nickel - (7440-02-0)	Not Available	Not Available	Not Available
Tin - (7440-31-5)	Not Available	Not Available	Not Available
Silicon - (7440-21-3)	Not Available	Not Available	Not Available
Silver	Not Available	Not Available	Not Available
Welding Fumes	Not Available	Not Available	Not Available
Copper Fumes	Not Available	Not Available	Not Available
Zinc Oxide Fumes	Not Available	Not Available	Not Available
Nickel Fumes	Not Available	Not Available	Not Available

Copper, Zinc, Nickel, Tin, Silicon
Toxicity
Very toxic to aquatic life.
Toxic to aquatic life with long lasting effects.
No additional information provided for this product.
Persistence and degradability
There is no data available on the preparation itself.
Bioaccumulative potential
Not Measured
Mobility in soil
No data available.
PBT and vPvB assessment This product contains no PBT/vPvB chemicals.
Other adverse effects
No data available.

13 Disposal considerations

Waste treatment methods
Recommendation:
The user of this material has the responsibility to dispose of unused material, residues and containers in compliance with all relevant local, state and federal laws and regulations regarding treatment, storage and disposal for hazardous and nonhazardous wastes.

Recommendation: Disposal must be made according to official regulations.

(Contd. on page 13)

14 Transport Information

UN-Number DOT, ADR, ADN, IMDG, IATA	Not Regulated
UN proper shipping name DOT, ADR, ADN, IMDG, IATA	Not Regulated
Transport hazard class(es) DOT, ADR, ADN, IMDG, IATA Class	Not Regulated
Packing group DOT, ADR, IMDG, IATA	Not Regulated
Environmental hazards: Marine pollutant:	Yes
Special precautions for user	Not applicable.
Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code	Not applicable.
UN "Model Regulation":	Not regulated.

15 Regulatory information

Product Name: Phosphorus/Copper Brazing Filler Metal

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 Codie 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 (ACGIIH)

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

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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^3 (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.

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,
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measures may not be required under particular or exceptional conditions or circumstances. Data may be changed from time to time.

[End of SDS]