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Vat Reg # 4800190995
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# SECTION 1 MATERIAL IDENTIFICATION AND USE

**MATERIAL NAME IDENTIFIER**: **Copper Phosphorus Brazing Alloys**

| | | |
|---|---|---|
| *Manufacture's Name:* | | *Street Address:* |
| *City:* | *Province/State/Country:* | *Emergency Phone No:* |
| *Supplier's Name: Dynamic Stainless Electrodes (Pty) Ltd* | | *Street Address:7 Dormehl Road Anderbolt* |
| *City: Boksburg* | *Province/State/Country:* ***South Africa*** | *Emergency Phone No:0103008885* |

| | | |
|---|---|---|
| **Chemical Name:** Silver Brazing Filler Metal | **Chemical Family:** Cadmium-Free Silver Brazing Alloys | **Chemical Formula:** Refer To Chart |
| **Molecular Weight:** N/Avl. | **Trade Names, Synonyms:** Refer To Chart | **Material Use:** Filler Metals For Brazing |

# SECTION 2 HAZARDOUS CHEMICAL COMPONENTS

| *Chemical Component* | *CAS Number* | *(Refer to filler metal chart below for nominal composition %)* |
|---|---|---|
| **SILVER** (Ag) | 7440-22-4 | **ACGIH:** TLVs (2000) 0.1 mg/m3 TWA (metal)<br>**OSHA PEL:** 0.01 mg/m3 TWA<br>**LD** 50 N/Avl. **LC** 50 N/Avl. |
| **COPPER** (Cu) | 7440-50-8 | **ACGIH:** TLVs (2000) 0.2 mg/m3 TWA (fume); 1.0 mg/m3 TWA (dusts & mists)<br>**OSHA PELS:** 0.1 mg/m3 TWA (fume); 1.0 mg/m3 TWA (dusts & mists)<br>**LD** 50 470 mg/kg oral-mouse **LC** 50 N/Avl. |
| **PHOSPHORUS** (P) | 7723-14-0 | **ACGIH:** TLVs (2000) 0.1 mg/m3 TWA as…….<br>**OSHA PELS:** 0.1 mg/m3 TWA<br>**LD** 50 470 mg/kg oral-mouse **LC** 50 N/Avl. |

## DSE SILVER BRAZING FILLER METALS CHART

| FILLER METAL NAME | AWS / SFA CLASS | Nominal Composition, % | | | Solidus (Melt Point) °F °C | Liquidus (Flow Point) °F °C | Brazing Range | Specific Gravity |
|---|---|---|---|---|---|---|---|---|
| | | Ag | Cu | P | | | °C | g/cm3 |
| Silver 15 | BCuP-5 | 15 | 80 | 5 | 1200-650 | 1475-800 | 650-800 | 8.4 |
| Silver 6 | BCuP-4 | 6 | 88 | 6 | 1285-695 | 1465-795 | 695-795 | - |
| Silver 5 | BCuP-3 | 5 | 89 | 6 | 1200-650 | 1495-810 | 650-810 | 8.2 |
| Silver 3 | - | 3 | 90.5 | 6.5 | - | - | - | - |
| Silver 2 | BCuP-6 | 2 | 91.5 | 6.5 | 1200-650 | 1495-810 | 650-810 | 8.1 |
| Phos. Copper 1 | BCuP-2 | 0 | 92.7 | 7.3 | 1305-705 | 1475-800 | 705-800 | 8.1 |
| Phos. Copper 2 | - | 0 | 93.8 | 6.2 | 1315-710 | 1615-880 | 710-880 | 8.1 |
| Silver 1 | - | 1 | 92.5 | 6.5 | 1200650 | 1495-810 | 650-810 | 8.1 |

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## SECTION 3 PHYSICAL DATA

**Physical State:** Gas Liquid Solid **Odour & Appearance:** No Odour; Solid Metal Wire, Strip, Powder, Paste
**Odour Threshold (ppm):** N/Avl. **Vapour Pressure (mm.Hg):** N/Avl. **Vapour Density (AIR=1):**Solid-N/Appl.
**Evaporation Rate:** Solid - N/Appl. **Boiling Point (ºC):** Solid - N/Appl. **Freezing Point (ºC):** Solid – N/Appl.
**% Volatile (By Volume):** N/Appl. **Solubility In Water (20ºC):** Insoluble **pH:** N/Appl.
**Specific Gravity:** Refer To Chart **Coeff.-Water Oil Disp.:** N/Appl.

## SECTION 4 FIRE AND EXPLOSION DATA

**Flammability:** Yes No **If yes, under which conditions?**
Dust, powder and fumes are flammable when exposed to flame or by chemical reaction with oxidizing agents *(see Section 5 for incompatible materials)*. Fires or explosions involving these alloys may release potentially toxic emissions of metal or metal oxide fumes *(see Section 2 for hazardous components)*.
**Means Of Extinction:** Dry powder for metal fires. Do not use water on dust, powder or fume fires.
**Special Procedures:** Use self-contained breathing apparatus with full face-piece operated in pressure demand or other positive pressure mode.
**Flashpoint(ºC) & Method:** Solid Metal - Non-Flammable **Upper Explosion Limit (% By Volume):** N/Appl.
**Lower Explosion Limit (%By Volume):** Solid Metal-N/Appl. **Auto Ignition Temperature (ºC):** Solid Metal - N/Appl.
**TDG Flammability Classification:** None **Hazardous Combustion Products:** Solid Metal - N/Appl.
**Sensitivity To Impact Explosion Data:** N/Appl. **Rate Of Burning:** N/Appl.
**Explosive Power:** N/Appl. **Sensitivity To Static Discharge:** N/Appl.

## SECTION 5 REACTIVITY DATA

*****AVOID DISPERSION OF FINELY DIVIDED PARTICLES IN AIR*****
**Chemical Stability:** Yes No **If yes, under which conditions?** Normal Ambient Environment.
**Incompatibility With Other Substances:** Yes No **If yes, which ones?**
Strong Oxidizers; Se; Te; Mg; Chlorates; $NH_3$; $HNO_3$; Azides; Ethanol; Ethylenimine; $ClF_3$; Inorganic and Organic Peroxides; Peroxyformic Acid; Chlorine and Fluorine; Permonosulphuric Acid; $CrO_3$; Mn and Ca Chlorides; $CS_2$; Hydrazine Mononitrate; Nitrobenzene; $Fe(CO)_5$; Seleninyl Bromide.
**Reactivity And Under What Conditions:** Stable under normal temperatures and pressures.
**Hazardous Decomposition Products:** Hazardous polymerization will not occur. Upon heating, danger is mostly from inhalation of metal (oxide) fumes. Overexposure to elemental oxide fumes or dust can cause nausea and metal fume fever. Use hooded exhaust ventilation to carry all fumes away from work area and, if necessary, use air supplied respirator (*see Section 7*). Thought should be given to the heating methods, flux and base metals being joined which could emit fumes on heating depending on their particular chemistry.
**Avoid overheating** *(see chart, Brazing Range)*.

## SECTION 6 TOXICOLOGICAL PROPERTIES

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| | | |
|---|---|---|
| **Route Of Exposure:** | ***Inhalation*** | Inhalation of the components of these products are not known to present a significant risk to health when used according to instructions and with appropriate protective measures *(see Section 7)*. Inhalation of the component/elements has been reported to cause one or more of the following symptoms/effects upon excessively high and/or prolonged inhalation/exposure. |
| **SILVER:** | ***Acute*** | May cause grey discolouration of mucous membranes. |
| | ***Chronic*** | May produce argyria, a permanent blue-grey discolouration of the skin, eyes, mucous membranes, and the respiratory tract. |
| **COPPER:** | ***Acute*** | Acute exposure to dust or fume may cause respiratory tract irritation, fever, muscle ache, chills, cough, weakness, and a metallic taste. |
| | ***Chronic*** | Exposure may cause damage to the liver, kidney, spleen, pancreas, and brain. |
| **ZINC:** | ***Acute*** | Exposure to zinc oxide fume may cause respiratory tract irritation and "metal fume fever", which is characterized by one or more of the following symptoms: metallic taste, dry throat, cough, chills, fever, tightness of chest, dyspnea, headache, nausea, vomiting, and fatigue. |
| | ***Chronic*** | Exposure unlikely. |
| **CADMIUM:** | ***Acute*** | Acute exposure to cadmium oxide fume by inhalation may produce pneumonitis, tracheobronchitis, and pulmonary edema. |
| | **Chronic** | Continued overexposure to cadmium (dust or fume) may produce gastrointestinal symptoms, anemia, rhinitis, discolouration of teeth, micro fractures, kidney disease and cancer. |
| **NICKEL:** | ***Acute*** | Dust or fumes may produce headache, nausea, vertigo, asthma, and pulmonary edema. |
| | ***Chronic*** | May increase the risk of cancer to the nasopharynx, lungs, prostate, and kidney. |

## SECTION 7 PREVENTATIVE MEASURES

**Personal Protective Equipment:** Personal protective equipment will be required when using these materials. The nature of the processing activity will determine what form of equipment is necessary, i.e., safety glasses, respirator, protective clothing, etc. Personal protective equipment should not be substituted for proper handling and engineering controls.

***Gloves:*** Wear appropriate protective gloves to prevent injury from the hazards of brazing and/or repeated contact with finely divided material. Avoid flammable fabrics.

***Respiratory:*** Local exhaust, mechanical ventilation, and/or respiratory equipment may be required to maintain a protection factor appropriate to the airborne concentrations of the contaminants generated and provide sufficient clean air for breathing. If exposure levels exceed OSHA PELS, wear a NIOSH/MSHA-approved respirator (or other approving authority) for protection from the airborne contaminants. All adjacent persons in the immediate vicinity of brazing or "soldering" operations shall be similarly protected as necessary by ventilation or approved respirators.

***Eyes:*** Wear eye protection (safety glasses, dust-proof goggles) adequate to prevent eye contact with this material in finely divided form and to prevent eye injury from the hazards of brazing. Plastic-frame safety spectacles with side shields and filter lenses (shade #3 or #4) are recommended.

***Footwear:*** Refer to workplace safety regulations.

***Clothing:*** Avoid flammable fabrics. Wear appropriate clothing to prevent skin injuries from the hazards of brazing.

**Other Protection:** Practice good housekeeping and personal hygiene procedures. To avoid ingestion of material, wash hands and face before eating, drinking, or consumption of tobacco. Brazing alloys may be used with a separately applied flux which, when heated, may emit irritating and/or toxic gases and fumes. Consult the MSDS for the specific flux in use to determine its hazards and appropriate protective measures. For general guidance, refer to American National Standards Institute (ANSI) Z49.1, "Safety in Welding and Cutting" (American Welding Society, Miami, FL 33135).

**Engineering Controls:** Adequate ventilation, sinks, showers, and eyewash stations should be provided. The best industrial control practice is to maintain concentrations of all chemical fumes and dusts as low as is practical.

**Leak And Spill Procedure:** If metal is molten, allow to solidify and cool. Clean up any spilled material so as to minimize dispersion of dusts. Wet sweeping or vacuuming using HEPA, or similarly approved filtration, are recommended methods.

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## SECTION 7 (Cont'd) PREVENTATIVE MEASURES

**Waste Disposal:** Return to manufacturer for reclaim. **Sara Title III - Hazard Classes:** Acute Health Hazard; Chronic Health Hazard **Handling Procedure And Equipment:** Avoid heating above brazing range *(see chart, Section 2)* as excessive fumes may result. Zinc boils at 1665°F/910°C) Use sufficient flux or atmosphere to protect the metals and minimize oxidation/vapourization during use.
**Storage Requirements***:* Avoid storage near incompatible materials *(see also Section 5)*. Also avoid conditions which create toxic fumes or dusts. Wash exposed skin after handling material. Stable at room temperature.
**Special Shipping Information:** No special requirements.
**WHMIS Classification:** Class D, Division 2, Subdivision B.

## SECTION 8 FIRST AID MEASURES

**Emergency And First Aid Procedures**
***Inhalation:*** Move victim to fresh air at once. Give oxygen if breathing is laboured, artificial respiration if victim is not breathing. Keep person warm and quiet. Get medical attention immediately.
***Skin:*** Contact in solid forms is not known to be hazardous. If clothing is contaminated with finely divided particles, remove. Wash affected area with large quantities of water for at least 5 minutes. Get medical attention if necessary.
***Eyes:*** Flush immediately with large amounts of water for at least 15 minutes while lifting the lower and upper eyelids. If irritation continues, get medical attention.
***Ingestion:*** If person is conscious, give large amounts of water and induce vomiting. Seek medical attention. If person is unconscious or convulsive, get immediate medical attention.

*****SEEK MEDICAL ATTENTION IN ALL CASES OF EXPOSURE*****
**SIGNS AND SYMPTOMS OF EXPOSURE:**

**Acute**
***Inhalation:*** Chills, fever, aching muscles, sneezing, dry throat, coughing, constriction of throat, nausea, irritation of nose and trachea, discolouration of mucous membranes, difficulty in breathing, chest pain, headache.
***Skin:*** Particles may cause irritation, pain, nausea, vomiting.
***Eyes:*** Particles may cause irritation, redness, itching.
***Ingestion:*** Nausea, vomiting, headache, diarrhea, fever, abdominal pain.
**Chronic**
***Inhalation:*** Cough, difficulty in breathing, laryngitis, discolouration of mucous membranes, kidney and liver disorders.
***Skin:*** May cause argaria, discolouration, contact dermatitis and/or allergic sensitization among hyper-susceptible individuals.
***Eyes:*** Irritation. May cause, particularly in powder form, argaria, conjunctivitis, and/or ulceration of the cornea.
***Ingestion:*** May cause damage to the liver, kidneys, musculoskeletal system and nervous system.
**Medical Conditions Generally Aggravated By Exposure:** *(see Section 6)*.
**Sources Used:** Canadian Centre For Occupational Health And Safety, Hamilton, Ontario; American Welding Society, Miami, Florida; ACGIH, Cincinnati, Ohio;
**Additional Information***:* The information contained herein is only for the manufactured product. The composition and hazards of any resultant fumes due to heating methods, filler metal alloy, flux and base metals employed may vary significantly.
Brazing fumes consist of various airborne substances which may create hazards to health when they are inhaled or swallowed. The degree of hazard to the worker(s) in the work area depends upon the composition of the total fume, the concentration of contaminants in the breathing air and the time-length of exposure to it. It is the responsibility of the user/employer to ensure the suitability of the material use and that TLV, TWA, and STEL values are not exceeded. Assessment of the possible exposure to the worker(s) to hazardous fumes, when required, should be carried out by a competent person and may involve air concentration measurements.

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## SECTION 9 STABILITY AND REACTIVITY

Stability: stable

Hazardous Polymerization: will not occur

Conditions to Avoid

Silver and copper can form unstable acetylides if in contact with acetylene gas.

Incompatible Materials
Strong oxidizers; ammonia; azides; nitric acid; ethylene imine; sulfuric acid; chlorine trifluoride; inorganic and organic peroxides; peroxyformic acid; oxalic acid; bromates, chlorates, and iodates of alkali and alkali earth metals; tartaric acid; 1-bromo-2-propyne; permonosulfuric acid; alkaline hydroxides.

Hazardous Decomposition Products

Heating to elevated temperatures may liberate metal/metal oxide fumes and/or phosphorus pentoxide.

## SECTION 10 TOXICOLOGICAL INFORMATION

Carcinogenicity

These products contain no chemicals classified as potential or demonstrated carcinogens by IARC, NTP, or OSHA.

Conditions Aggravated by Overexposure

Pre-existing pulmonary diseases (e.g., bronchitis, asthma) may be aggravated by inhalation overexposure, particularly as fume. Chronic overexposure by inhalation and/or ingestion may aggravate pre-existing diseases of the liver, kidneys, gastrointestinal system, and nervous system.

Ingredient(s) - Toxicological Data

Copper LD50: No data available LC50: No data available
Phosphorus LD50: >15,000 mg/kg (oral/rat) LC50: 4,300 mg/m3 for 1 hr (rat)
Silver LD50: >2,000 mg/kg (oral/rat) LC50: No data available

## SECTION 11 ECOLOGICAL INFORMATION

In their intended manner of use, these products should not be released into the environment, and adverse effects on ecosystems are not anticipated under recommended conditions of use, storage, and disposal.

## SECTION 12 DISPOSAL CONSIDERATION

Dispose of unused or unusable product in accordance with applicable Federal, State/Provincial, and local regulations.

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## SECTION 13 TRANSPORT INFORMATION

These products are not Hazardous Substances or Dangerous Goods.

## SECTION 14 REGULATORY INFORMATION

NOT APPLICABLE

## SECTION 15 OTHER INFORMATION

HMIS Ratings

Health - 2* Flammability - 1 Physical
Hazard - 0
PPE - see Note
Note: DSE recommends use of protective eyewear and gloves as standard PPE.
HMIS recommends that its ratings be used only in conjunction with a fully implemented HMIS program, and that specific PPE codes be created by the user, who is familiar with the actual conditions under which the product is used. We cannot anticipate every condition of the product's use, and it is the user's responsibility to evaluate the hazards pertinent to its specific operations, and to determine the specific PPE required.

NFPA Ratings

Health - 2
Flammability - 1
Reactivity - 0

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| SECTION 16 | PREPARATION DATE OF MSDS | |
|---|---|---|
| **PREPARED BY:**<br>Marketing Department | **PHONE NO:**<br>0103008885 | **DATE:**<br>07/2015 |