

SAFETY DATA SHEET

SECTION 1. IDENTIFICATION



Great Lakes Orthodontics
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CHEMTREC: 800-424-9300

Product Name: Electrodes
Product Number: 240-026, 240-027, 240-028, 240-029

Effective Date: 10/30/13

SECTION 2. HAZARDOUS IDENTIFICATION

Potential Health Effects:

Primary Routes of Entry

- Inhalation
- Ingestion

Medical Conditions Aggravated by Exposure

- 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.

Human Effects and Symptoms of Overexposure:

Skin

Skin contact with these products, particularly in finely divided forms, may cause irritation, discoloration, and/or contact dermatitis.

Ingestions

Ingestion of these products in finely divided forms may cause nausea, vomiting, and gastrointestinal irritation.

Eyes

- **Silver/Copper/Tin/Zinc/Alloy**

Contact with these products in finely divided forms may cause irritation, conjunctivitis, ulceration of the cornea, and/or argyria, a blue-gray discoloration of the eyes, skin, mucous membranes, and respiratory tract.

- **Brass and Bronze Alloys**

Eye contact with these products in finely divided forms may cause irritation, and / or conjunctivitis upon prolonged contact.

Inhalation

Inhalation of the components of these products is not known to present a significant risk to health when used according to instructions with appropriate protective measures (see Section #8).

Inhalation of component elements has been reported to cause one or more of the following symptoms and effects upon excessively high or prolonged exposure.

- **Copper**

Acute exposure may cause respiratory tract irritation, fever, muscle, ache, chills, cough, weakness, chills, and a metallic taste.

- **Zinc**

Acute exposure to zinc oxide may cause respiratory tract irritation and “metal fume fever”, which is characterized by a metallic taste, cough, dry throat, chills, fever, tightness of chest, headache, nausea, shortness of breath, vomiting, and fatigue.

- **Tin**

Exposure to tin dust or fume by inhalation may cause stenosis (a benign pneumoconiosis), shortness of breath, and respiratory tract irritation.

Chronic Effects or Exposure

- **Silver**

Chronic exposure via inhalation may cause argyria.

Carcinogenicity

No carcinogenic substances as defined by IARC, NTP and / or OSHA.

SECTION 3. COMPOSITION / INFORMATION ON INGREDIENTS
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Silver / Copper / Tin / Zinc Alloys

<u>Hazardous Components</u>	<u>CAS #</u>	<u>%</u>
Copper	7440-50-8	4 – 41
Silver	7440-22-4	24 – 81
Tin	7440-31-5	1 – 26
Zinc	7440-66-6	1 – 35

Brass and Bronze Alloys

<u>Hazardous Components</u>	<u>CAS #</u>	<u>%</u>
Copper	7440-50-8	40 – 91
Zinc	7440-66-6	11 – 60

SECTION 4. FIRST AID MEASURES

Eye Contact

Flush affected areas with water for at least fifteen minutes. Seek medical assistance if necessary.

Skin Contact

Remove contaminated clothing. Wash affected area with large quantities of water for at least five minutes. Seek medical attention if necessary. Launder or dry-clean clothing before reuse.

Inhalation

If signs and symptoms of toxicity are observed, remove subject from area, administer oxygen, and seek medical attention. Keep the subject warm and at rest. Perform artificial respiration if breathing has stopped.

Ingestion

If subject is conscious, induce vomiting. Obtain medical assistance. Do not attempt to give anything by mouth to an unconscious or convulsive person.

Not to Physician (Silver / Copper / Tin / Zinc Alloys)

None of the components are acutely toxic by ingestion, nor are they absorbed through the skin. Extensive or prolonged skin contact may cause dermatitis and / or argyria.

Note to Physician (Brass and Bronze Alloys)

None of the components are acutely toxic by ingestion, nor are they absorbed through the skin. Inhalation of high levels of copper and zinc fume have been known to cause pulmonary distress and /or “metal fume fever”.

SECTION 5. FIRE FIGHTING MEASURES

Suitable Extinguishing Media

- Silver / Copper / Tin / Zinc Alloys

Dry chemical. Do not use water.

- Brass and Bronze Alloys

Carbon Dioxide (CO₂), Dry Chemical, or Foam.

Special Fire Fighting Procedures

If fighting a fire in which this product is present, wear a self-contained breathing apparatus with full face-piece operated in pressure demand or other positive pressure mode.

Unusual Fire / Explosion Hazards

None.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Spill and Leak Procedures

If a finely divided form of product is spilled, clean up spillage so as to minimize dispersion of dust. Wet sweeping or vacuuming using HEPA filtration is recommended.

SECTION 7. HANDLING & STORAGE

Handling Precautions

No special handling precautions are required.

Storage Precautions

Do not store in proximity to incompatible materials (see Section #10).

Further Info on Storage Conditions

None.

SECTION 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Industrial Hygiene

To minimize ingestion, wash hands and face before eating, drinking, applying cosmetics, or using tobacco.

Ventilation Measures

Use appropriate ventilation (e.g.: dilution, local exhaust) adequate to maintain concentrations of all components and their byproducts to within their applicable standards.

Respiratory Protection

If an exposure level exceeds an applicable exposure standard, use a NIOSH approved respirator having a configuration (type of face-piece, filter media, assigned protection factor, etc.) appropriate to the concentration of the contaminant(s) generated. For guidance on selection and use of respirators, consult American National Standard Z88.2 (ANSI, New York, NY 10036 USA).

- **Copper**

ACGIH TLVs – 0.2 mg/m³ TWA (Fume); 1 mg/m³ TWA (dusts and mists)

OSHA PELs – 0.1 mg/m³ TWA (Fume); 1 mg/m³ TWA (dusts and mists)

- **Zinc**

ACIGH TLVs (as ZnO) – 2 mg/m³ TWA; 10 mg/m³ STEL (respirable fractions)

OSHA PEL – 5 mg/m³ TWA (as ZnO fume)

- **Silver**

ACGIH TLV – 0.1 mg/m³ TWA (Metal)

OSHA PEL – 0.01 mg/m³ TWA

- **Tin**

ACGIH TLV – 2 mg/m³ TWA (as Sn)

OSHA PEL – 2 mg/m³ TWA (as Sn)

Eye Protection

Wear eye protection to prevent eye contact with finely divided product and eye injury if products are used with a flame. Plastic frame spectacles with side shields and filter lenses (shade #3 / #4) are recommended.

Skin and Body Protection

Wear appropriate protective gloves and clothing to prevent skin injury if these products are used with a flame and/or for prolonged or repeated contact with finely divided forms of product. Avoid flammable fabrics.

Additional Protective Measures

None.

SECTION 9. PHYSICAL & CHEMICAL PROPERTIES

Brass and Bronze Alloys

- **Appearance** – wire, rod, powder, strip, grain, or preformed shapes
- **Color** – Light copper
- **Odor** – Odorless
- **Specific Gravity** – 7.9 – 8.8
- **Solubility in Water** – Insoluble

Not applicable – Odor threshold, evaporation rate, vapor pressure, vapor density, boiling point, freezing point, viscosity, PH, oil-water partition coefficient, percent volatiles, percent VOCs, flash point, auto-ignition, upper and lower flammable limit.

Silver / Copper / Tin / Zinc Alloys

- **Appearance** – Various forms
- **Color** – White to light yellow
- **Odor** – Odorless
- **Specific Gravity** – 8.7 – 9.4
- **Melting Point** – 1145 – 1270 °F (620 – 690 °C)
- **Solubility in Water** - Insoluble

Not applicable – Odor threshold, evaporation rate, vapor pressure, vapor density, freezing point, viscosity, oil-water partition coefficient, percent volatiles, percent VOCs, flash point, auto-ignition, upper and lower flammable limit.

SECTION 10. STABILITY & REACTIVITY

Hazardous Reactions – Hazardous polymerization will not occur.

Stability – Stable

Materials to Avoid –

- **Brass and Bronze Alloys**

Strong oxidizers, strong acids, ammonium nitrate, chlorates, bromates, and iodates of alkali and alkali earth metals, inorganic nitrates, inorganic and organic peroxides, halogens, carbon disulfide, hydrazine mononitrate, hydroxylamine, selenium, tellurium, and azides.

- **Silver / Copper / Tin / Zinc Alloys**

Strong oxidizers, ammonia, azides, nitric acid, ethylene imine, chlorine trifluoride, bromine trifluoride, sulfuric acid, inorganic and organic peroxides, peroxyformic acid, oxalic acid, tartaric acid, 1-bromo-2-propyne, permonosulfuric acid, bromates, chlorates, and iodates of alkali and alkali earth metals, halogens, carbon disulfide, hydrazine mononitrate, selenium, hydroxylamine, tellurium, cupric nitrate, and sulfur.

Conditions to Avoid – Copper can form an unstable acetyl ide in contact with acetylene gas.

Hazardous Decomposition Products – Heating to elevated temperatures may liberate metal / metal oxide fumes.

SECTION 11. TOXICOLOGICAL INFORMATION

Copper

- LD50: No data available
- LC50: No data available

Zinc

- LD50: No data available
- LC50: No data available

Silver

- LD50: >2,000 mg/kg (oral / rat)
- LC50: No data available

Tin

- LD50: No data available
- LC50: No data available

SECTION 12. ECOLOGICAL INFORMATION (non-mandatory)

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 13. DISPOSAL CONSIDERATIONS (non-mandatory)

Waste Disposal Method

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

SECTION 14. TRANSPORT INFORMATION (non-mandatory)

These products are not Hazardous Substances or Dangerous Goods per USDOT, TDG (Canada), IATA, or IMO regulations.

SECTION 15. REGULATORY INFORMATION (non-mandatory)

TSCA

All components of these products are listed in the EPA's TSCA Inventory.

SARA Hazard Classes

Acute Health Hazard; Chronic Health Hazard

United States Federal Regulations**Brass and Bronze Alloys**

- **Copper**

SARA Title III – Section 313 Form “R” / Tri Reportable Chemical

Canadian Regulatory Information

All components of these products are listed on the Domestic Substances List (DSL) or the Nondomestic Substances List (NDSL).

WMIS Class(es) and Division(s) – D2B

Component(s) on Ingredients Disclosure List

- Copper, elemental (CASRN 7440-50-8)

United States Federal Regulations**Silver / Copper / Tin / Zinc Alloys**

These products contain these ingredients in concentrations greater than 1% (for carcinogens 0.1%) regulated under Section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 or 40 CFR 372.

- **Copper** (CASRN 7440-50-8)
- **Silver** (CASRN 7440-22-4)

Canadian Regulatory Information

All components of these products are listed on the Domestic Substances List (DSL) or the Nondomestic Substances List (NDSL).

WMIS Class(es) and Division(s) – D2B

Component(s) on Ingredients Disclosure List

- Copper, elemental (CASRN 7440-50-8)
- Silver, elemental (CASRN 7440-22-4)
- Tin, elemental (CASRN 7440-31-5)

SECTION 16. OTHER INFORMATION (non-mandatory)

Brass and Bronze Alloys:

HMIS Rating:

- **Health** – 2
- **Flammability** – 1
- **Physical Hazard** – 0

NFPA Rating:

- **Health** – 2
- **Flammability** – 1
- **Reactivity** – 0

Silver / Copper / Tin / Zinc

HMIS Rating:

- **Health** – 1
- **Flammability** – 1
- **Physical Hazard** – 1

NFPA Rating:

- **Health** – 1
- **Flammability** – 1
- **Reactivity** – 1

0 = Minimal, 1 = Slight, 2 = Moderate, 3 = Serious, 4 = Severe

* = Chronic Health Hazard