

## 1. PRODUCT AND COMPANY IDENTIFICATION

### 1.1 Product Identifier

**Product Name:** Silver-Copper-Zinc-Tin Alloys  
**Common Name:** Orthodontic Supplies (Soldering/Brazing)  
**Material:** Silver, Copper, Zinc, Tin  
**Restrictions on Use:** American Orthodontics' products are used for the treatment of malocclusions and craniofacial abnormalities as diagnosed by a trained dental professional or orthodontist. Federal law restricts this device to use by or on the order of a dentist or orthodontist.  
**EC No.:** 231-131-3 (Silver); 231-159-6 (Copper); 231-175-3 (Zinc); 231-141-8 (Tin)  
**REACH Registration No.:** 01-2119555669-21-XXXX (Silver); 01-2119486474-28-XXXX (Tin)  
**CAS No. / IUPAC:** 7440-22-4 (Silver); 7440-50-8 (Copper); 7440-66-6 (Zinc); 7440-31-5 (Tin)

### 1.2 Relevant Identified Uses/ Uses Advised Against

**Relevant identified uses:** Dental/Orthodontic use only  
**Uses advised against:** Not for Consumer use. Please see "Restrictions on Use"

### 1.3 Details of the Supplier of the Safety Data Sheet

**Company Name:**  
 American Orthodontics  
 3524 Washington Avenue  
 Sheboygan, WI 53081  
 Phone: 920-457-5051  
 Fax: 920-457-1485  
  
**E-mail:** info@americanortho.com  
**National Contact:** Safety Department

### 1.4 Emergency Telephone Number

**Emergency Response Number:**  
 920-457-5051  
 Only available during office hours: 8:00AM – 5:00PM (Central Time)  
 Language of Phone Service: English

## 2. HAZARDS IDENTIFICATION

### 2.1 Classification of the substance or mixture

**2.1.1 Classification according to Regulation (EC) No. 1272/2008 [CLP]**  
 Specific Target Organ Toxicity, Single Exposure: Hazard Category 3

### 2.2 Label Elements

Labelling according to Regulation (EC) No 1272/2008 [CLP]

### Hazard Pictogram(s)



GHS07 Harmful

**Signal Word(s): Warning**

Hazard Statements:

May cause respiratory irritation.

Precautionary Statements:

Avoid breathing dust or fume.

Use only outdoors or in a well-ventilated area. Store locked up.

IF INHALED: Remove person to fresh air and keep comfortable for breathing.

Call a Poison Control Center or doctor if you feel unwell.

Dispose of contents and container in accordance with applicable regulations.

19-76% of the products consist of ingredient(s) of unknown acute toxicity.

Supplemental Hazard information (EU):

Not applicable.

**3. COMPOSITION / INFORMATION ON INGREDIENTS**

<u>Ingredient(s)</u>	<u>CAS No.</u>	<u>EC No.</u>	<u>Wt. % Content (or Range)</u>
Copper	7440-50-8	231-159-6	3 – 45%
Silver	7440-22-4	231-131-3	20 – 81%
Tin	7440-31-5	231-141-8	<1 – 30%
Zinc	7440-66-6	231-175-3	1 – 35%

**4. FIRST-AID MEASURES**

**4.1 Description of First-Aid Measures**

General Notes

Avoid breathing dust or fume. Use only outdoors or in a well-ventilated area.

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.

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.

Eye Contact

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

Ingestion/Swallowing

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

Self-Protection of First-Aider

Avoid breathing dust or fume. Wear protective gloves and clothing to prevent exposure to dust/fumes.

**4.2 Important Symptoms and Effects**

Signs and symptoms of exposure include irritation, conjunctivitis, ulceration of the cornea,

argyria, discoloration, contact dermatitis, nausea, vomiting, and gastrointestinal irritation. If feeling unwell, seek medical attention.

#### 4.3 Medical Attention & Special Treatment Necessary

Call a Poison Control Center or doctor if you feel unwell.

#### Notes to the Doctor:

None of the components are acutely toxic by ingestion, nor are they absorbed through the skin. Long-term chronic exposure may cause argyria.

## 5. FIRE AND EXPLOSION HAZARDS

### 5.1 Extinguishing Media

Suitable Extinguishing Media:

Use dry chemical.

Extinguishing Media which should not be used:

Do not use water.

### 5.2 Special Exposure Hazards from Substance/Mixture

Hazardous Combustion Products:

This product is non-flammable and non-explosive. If present in a fire or explosion, it may emit fumes of the constituent metals or their oxides.

### 5.3 Advice for Firefighters

Firefighting Methods:

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

Special protective equipment for fire-fighters:

Self-contained breathing apparatus with full facepiece operated in pressure-demand or other positive pressure mode.

## 6. ACCIDENTAL RELEASE MEASURES

### 6.1 Personal Precautions, Protective Equipment & Emergency Procedures

#### 6.1.1 For Non-Emergency Personnel

Protective Equipment

Protective gloves and clothing – avoid flammable fabrics. Plastic-frame spectacles with side shields are recommended.

#### 6.1.2 For Emergency Responders

Protective Equipment

Protective gloves and clothing – avoid flammable fabrics, eye protection.

### 6.2 Environmental Precautions

Prevent spills from entering sewers or contaminating soil.

**6.3 Methods & Material for Containment & Cleaning Up**

**6.3.1 For Containment**

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

**6.3.2 For Cleaning Up**

Wet sweeping or vacuuming using HEPA filtration is recommended.

**6.3.3 Other Information**

Do not discharge waste product into sanitary or storm sewers or allow it to contaminate soil. Dispose of contents and container in accordance with applicable Federal, State/Provincial, and local regulations.

**6.4 Reference to other sections (as applicable)**

Refer to Sections 8 and 13 for Exposure Controls, Personal Protection, and Disposal Considerations.

**7. HANDLING AND STORAGE**

**7.1 Precautions for Safe-Handling**

Protective Measures:

Measures to prevent aerosol and dust generation:

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

Measure to protect the environment

Prevent spills from entering sewers or contaminating soil

Advice on General Occupational Hygiene:

To prevent ingestion following use of the product, wash hands and face before eating, drinking, applying cosmetics, or using tobacco. Remove contaminated clothing or protective equipment before entering eating/drinking areas.

**7.2 Conditions for Safe Storage, Including Any Incompatibilities**

Technical Measures & Storage Conditions

Store locked up.

Requirements for Storage Rooms & Vessels

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

**8. EXPOSURE CONTROLS / PERSONAL PROTECTION**

**8.1 Control Parameters**

Component	OSHA PELs (Permissible Exposure Limits)	ACGIH TLVs (Threshold Limit Values)
Copper	0.1 mg/m <sup>3</sup> TWA (fume) 1 mg/m <sup>3</sup> TWA (dusts and mists)	0.2 mg/m <sup>3</sup> TWA (fume) 1 mg/m <sup>3</sup> TWA (dusts and mists)
Silver	0.01 mg/m <sup>3</sup> TWA	0.1 mg/m <sup>3</sup> TWA (metal)
Tin	2 mg/m <sup>3</sup> TWA	2 mg/m <sup>3</sup> TWA
Zinc	5 mg/m <sup>3</sup> TWA (as respirable fraction of ZnO dust or fume)	2 mg/m <sup>3</sup> TWA (as ZnO) 10 mg/m <sup>3</sup> STEL (respirable fractions)

Ingredients – Biological limits

Copper – No ACGIH BEI(s) or other biological limit(s)

Silver – No ACGIH BEI(s) or other biological limit(s)

Tin – No ACGIH(s) or other biological limit(s)

Zinc – No ACGIH(s) or other biological limit(s)

**8.2 Exposure Controls**

**8.2.1 Appropriate Engineering Controls**

Technical Measures to Prevent Exposure

Use dilution or local exhaust ventilation adequate to maintain concentrations of all components and their byproducts to within their applicable standards.

**8.2.2 Personal Protective Equipment**

**8.1.2.1 Eye & Face Protection**

Wear eye protection adequate to prevent eye contact with the product and injury if the product is used with a flame. Plastic-frame spectacles with side shields are recommended. As standard PPE, it is recommended that protective eyewear is of Personal Protection Index “B”.

**8.2.2 Skin Protection**

Hand Protection

Wear protective gloves to prevent skin injuries if the product is used with a flame. Avoid flammable fabrics. As standard PPE, it is recommended that protective gloves are of Personal Protection Index “B”.

Other Skin Protection

Wear protective clothing to prevent skin injuries if the product is used with a flame. Avoid flammable fabrics.

**8.2.2.3 Respiratory Protection**

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

**8.2.2.4 Thermal Hazards**

Avoid using flammable fabrics for personal protective equipment.

**8.2.2.5 Other Information**

The supplier recommends use of protective eyewear and gloves (Personal Protection Index "B") 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. The supplier 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.

**9 PHYSICAL AND CHEMICAL PROPERTIES**

**9.1 Basic Physical & Chemical Properties**

Appearance:	White to light-yellow metals, various forms.
Odor:	None.
Odor Threshold:	Not applicable.
pH:	Not applicable.
Melting Point:	> 1,195°F / 646°C

Freezing Point:	Not applicable.
Flash Point:	Not applicable.
Evaporation Rate:	Not applicable.
Flammability (solid, gas):	Not applicable.
Upper/Lower Flammability or Explosive Limits:	Not applicable.
Vapor Pressure:	Not applicable.
Vapor Density:	Not applicable.
Relative Density:	8.7 – 9.5 (H <sub>2</sub> O)
Solubility(ies):	Insoluble.
Partition Coefficient: n-octanol/water):	Not applicable.
Auto-Ignition Temperature:	Not applicable.
Decomposition Temperature:	Not applicable.
Viscosity:	Not applicable.

## 10 STABILITY AND REACTIVITY

### 10.1 Reactivity

None reasonable foreseeable.

### 10.2 Chemical Stability

Stable.

### 10.3 Possibility of Hazardous Reactions

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

### 10.4 Conditions to Avoid

Refer to Section 10.5 – Incompatible Materials.

### 10.5 Incompatible Materials

Acetylene; ammonia; azides; nitric acid; halogens; ethylene imine; ethylene oxide; chlorine trifluoride; sulfuric acid; peroxides; peroxyformic acid; oxalic acid; tartaric acid; 1-bromo-2-propyne; permonosulfuric acid; hydrazine mononitrate; hydrazoic acid; hydrogen sulfide; bromates, chlorates, and iodates of alkali and alkali earth metals; hydroxylamine; selenium; tellurium; carbon disulfide; cupric nitrate.

### 10.6 Hazardous Decomposition Products

Heating to elevated temperatures may liberate metal/metal oxide fumes.

### 10.7 Hazardous Polymerization

Will not occur.

## 11 TOXICOLOGICAL INFORMATION

### 11.1 Information on Toxicological Information

#### Acute Toxicity

The acute toxicities of 5-80% of the products' ingredients are unknown. Primary routes of entry: ingestion, inhalation.

#### Chronic Health Effects

Chronic overexposure by inhalation and/or ingestion may aggravate pre-existing diseases of the liver, kidneys, and gastrointestinal system.

#### Skin Corrosion

Skin contact with this product, particularly in finely-divided forms, may cause irritation,

argyria, discoloration, and/or contact dermatitis.

**Serious Eye Damage/Irritation**

Eye contact with this product in finely-divided forms may cause irritation, conjunctivitis, ulceration of the cornea, and/or argyria, a permanent gray discoloration of the eyes, skin, mucous membranes, and respiratory tract.

**Respiratory/Skin Sensitization**

Skin contact with this product, particularly in finely-divided forms, may cause irritation, argyria, discoloration, and/or contact dermatitis.

**Germ Cell Mutagenicity**

The product contains no chemicals determined to be germ cell mutagens.

**Carcinogenicity**

The product contains no chemicals classified as potential or demonstrated carcinogens by IARC, NTP, or OSHA.

**Reproductive Toxicity**

The product contains no chemicals determined to be damaging to fertility or to the unborn child.

**Aspiration Hazard**

Inhalation of toxicologically-significant quantities of the components is unlikely when the product is used in accordance with instructions and specified protective measures (see Section 8).

**Signs & Symptoms of Exposure**

Signs and symptoms of exposure include irritation, conjunctivitis, ulceration of the cornea, argyria, discoloration, contact dermatitis, nausea, vomiting, and gastrointestinal irritation.

**Medical Conditions Generally 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, and gastrointestinal system.

**11.1.1 Acute Toxicity**

Estimate

LD50 (oral):>2,000 mg/kg

**12 ECOLOGICAL INFORMATION**

No ecological data is available for the product. Available ecological data for the components is as follows:

Copper: No data available for Aquatic Toxicity to Fish and Invertebrates, Aquatic Toxicity to Plants and Microorganisms, Toxicity to Terrestrial Organisms, Persistence and Degradability, Bioaccumulation Potential, Mobility in Soil.

Silver: No data available for Aquatic Toxicity to Fish and Invertebrates, Aquatic Toxicity to Plants and Microorganisms, Toxicity to Terrestrial Organisms, Persistence and Degradability, Bioaccumulation Potential, Mobility in Soil.

Tin: No data available for Aquatic Toxicity to Fish and Invertebrates, Aquatic Toxicity to Plants and Microorganisms, Toxicity to Terrestrial Organisms, Persistence and Degradability, Bioaccumulation Potential, Mobility in Soil.

Zinc: No data available for Aquatic Toxicity to Fish and Invertebrates, Aquatic Toxicity to Plants and Microorganisms, Toxicity to Terrestrial Organisms, Persistence and Degradability, Bioaccumulation Potential, Mobility in Soil.

**13 DISPOSAL CONSIDERATIONS**

**13.1 Waste Treatment Methods**

**13.1.1 Product/Packaging disposal:**

Do not discharge waste product into sanitary or storm sewers or allow it to contaminate soil. Consult applicable Federal, State/Provincial, and local regulations.

**14 TRANSPORTATION INFORMATION**

Transport is not regulated by USDOT, TDG (Canada), IATA, or IMO.

**15 REGULATORY INFORMATION**

**15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture**

**National Regulations (USA):**

All components of this product are listed on the EPA's TSCA inventory.  
SARA Hazard Classes: Acute Health Hazard; Chronic Health Hazard  
SARA Section 313 Notification

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This product contains these components in concentrations >1% (>0.1% for carcinogens) subject to Section 313 of the Emergency Preparedness and Community Right-to-Know Act (EPCRA) of 1986 and of 40CFR, Part 372:

1. Copper (CASRN 7440-50-8)
2. Silver (CASRN 7440-22-4)

**Canadian Regulations:**

All components of these products are listed on either the Domestic Substances List (DSL) or the Nondomestic Substances List (NDSL). This product has been classified in accordance with Canada's Hazardous Products Regulations (SOR/DORS/2015-17).

**15.2 Chemical Safety Assessment:**

No chemical safety assessment has been carried out for this substance/mixture by the supplier.

**16 ADDITIONAL INFORMATION**

**16.1 Indication of changes/revision to SDS:**

1. New format
2. Inclusion of EC Requirements
3. **Revision Date:** 07/30/2018

**16.2 Abbreviations and acronyms:**

- TWA – Time Weighted Average
- STEL – Short-Term Exposure Limits
- BEI – Biological Exposure Index
- EPA – Environmental Protection Agency
- TSCA – Toxic Substances Control Act
- SARA – Superfund Amendments and Reauthorization Act
- IARC – International Agency for Research on Cancer
- NTP – National Toxicology Program
- OSHA – Occupational Safety and Health Administration
- USDOT – United States Department of Transportation
- TDG – Transport of Dangerous Goods



IATA – International Air Transport Association

IMO – International Maritime Organization

**16.3 Key literature references and sources for data**

1. Guidance on the Compilation of Safety Data Sheets; European Chemical Agency (ECHA); Version 2.1, February 2014
2. Regulation (EC) No 1272/2008 of the European Parliament and the Council of 16 December 2008 on classification, labelling, and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006

**16.4 Classification and procedure used to derive classification for mixtures according to Regulation (EC) 1272/2008[CLP]:**

None.

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Some of the information presented and conclusions drawn herein are from sources other than direct test data on the product itself. The information in the SDS was obtained from sources that we believe are reliable and is believed to be valid and accurate. American Orthodontics, however, makes no warranty, express or implied, regarding its correctness of the information provided. The conditions or method of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage, or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. If the product is used as a component in another product or used in a way other than recommended by the Company, this SDS information may not be applicable. **Reasonable safety precautions must always be observed.**