



Safety Data Sheet Beryllium

Version: 1.0 Page 1 of 7

SAFETY DATA SHEET

Date Issued: March, 2018

Revisions of: FA1400 January 2003; April, 2015

1. PRODUCT AND COMPANY IDENTIFICATION:

Product Name: Beryllium C17000, C17200, C17500, C17510, CCNB Alloys

DISTRIBUTOR: Southern Copper & Supply Company, Inc.
875 Yeager Parkway, Pelham, Alabama 35124

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2. HAZARD IDENTIFICATION

GHS Classification: Solid, Alloy, Mixture: Carcinogenicity, category 1, Specific target organ toxicity, repeated exposure, category 1.

GHS Label Elements, Symbol(s)



Signal Word: DANGER

Hazard Statements: Reference OSHA 29 CFR 1910-1024 Beryllium Standard. May effect lungs, causes damage to lungs through prolonged or repeated inhalation exposure; such as acute/chronic beryllium disease (CBD). May cause cancer. May cause cancer by inhalation. May cause asthma symptoms or breathing difficulties if inhaled. Causes damage to organs (respiratory system). May cause allergic skin reaction or sensitization; may cause eye and respiratory track irritation.

Precautionary Statements: Do not breath dust or fume; Wear protective gloves/protective clothing/eye protection/face protection; In case of inadequate ventilation, wear respiratory protection. Wash thoroughly after handling

NOTE: This safety data sheet (SDS) provides information on a specific group of manufactured metal alloy products. As these metal alloy products may share a common physical nature and constituents, the data presented may be applicable to all alloys identified. In the solid form in which it is provided this material does not pose a health hazard. Subsequent operations performed by the end user may alter this via machining, exposure to heat, melting/casting or other metalworking operations. As a result of such working, there may be a potential for the alloy to be released as an inhalable dust. IBC Advanced Alloys does not warranty this material for any specific application and all precautions must be taken by the end user to prevent and protect against inhalable particulate. See section 8 for information on exposure controls and personal protection.



Safety Data Sheet

Product Name: C17000, C17200, C17500, C17510, CCNB Alloys

Version: 1.0

Page 2 of 7

3. COMPOSITION/INFORMATION ON INGREDIENTS

<u>ELEMENT</u>	<u>CAS#</u>
COPPER (Cu)	7440-50-8
IRON (Fe)	7439-89-6
NICKEL (Ni)	7440-02-0
COBALT (Co)	7440-48-4
SILICON (Si)	7440-21-3
BERYLLIUM (Be)	7440-41-7
ALUMINUM (Al)	7429-90-5

UNS #	Description	Cu	Fe	Ni	Co	Si	Be	Other
C17000	Beryllium Copper	Bal	-	-	.20 -.60	-	1.60 -1.79	-
C17200 ⁽⁴⁾	Beryllium Copper	Bal	-	.20	.20 min ⁽²⁾	-	1.80 - 2.00	.20 Al
C17500	Beryllium Copper	Bal	.10	-	2.4-2.7	.20	.4-.7	.20 Al
C17510 ⁽⁴⁾	Beryllium Copper	Bal	-	1.40-2.20	-	-	0.20-0.60	-
CCNB	Beryllium Copper	Bal	-	1.0-1.30	1.0 -1.3	-	.4-.7	-

(2) Ni+Co, 0.20% min; Ni+Fe+Co, 0.6% max

(4) Cu+Sum of Named Elements, 99.5% min.

(5) Cu+Sum of Named Elements, 99.7% min

4. FIRST AID MEASURES

General Information: In solid form as supplied, there is no immediate medical risk with beryllium products. First aid measures provided are related to exposure to dust/particulate containing beryllium. If exposed or concerned: seek medical attention/advice. Seek medical attention if symptoms occur. Wash contaminated clothing separate from other clothing before reuse.

Inhalation: Immediately remove any clothing soiled by the product. Remove respirator only after contaminated clothing has been completely removed. Remove individual to fresh air, keep warm and quiet. Seek medical attention if wheezing, coughing, shortness of breath, etc. are apparent.

Ingestion: Rinse mouth with water. Do not induce vomiting. Seek medical attention.

Skin Contact: Keep open wounds covered when exposed to dust/particulate. Remove contaminated clothing; wash affected area with soap and water. If irritation or blistering occurs seek medical attention. Wash contaminated clothing separately before reusing.

Eye Contact: Rinse eyes with lukewarm water for several minutes. If eye irritation persists seek medical attention.



Safety Data Sheet

Product Name: C17000, C17200, C17500, C17510, CCNB Alloys

Version: 1.0

Page 3 of 7

5. FIRE FIGHTING MEASURES

General Fire Hazards: See Section 9 for Flammability Properties. This product does not present fire or explosion hazard as shipped. Fine dust from processing may ignite if allowed to accumulate and exposed to an ignition source.

Hazardous Combustible Products: When heated, alloy could emit toxic fumes. In event of fire avoid breathing fumes. May cause sensitization by inhalation and by skin contact.

Extinguishing Media: Isolate the fire and use class "D" fire extinguishing materials such as Lith-X, Dry Graphite, etc

Unsuitable Extinguishing Media: Do Not use water, foam or halon.

Special Protective Equipment and Precautions for Firefighters: Firefighters should wear full protective gear and self contained breathing apparatus when necessary.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment and Emergency Procedures: Wear appropriate respiratory and protective equipment specified in the OSHA 29 CFR 1910-1024 Beryllium Standard, see Section 8. Avoid creating dusts. Avoid breathing dust or fumes. Isolate spill area and provide ventilation.

Methods and Materials for Containment and Clean Up: For larger pieces, pick up mechanically. For chips or dust, vacuum area using a system equipped with a HEPA filtration system and place in properly labeled closed containers. Special precautions must be taken when changing filters on HEPA vacuum systems used to clean up spills to prevent releases of contaminated materials. Caution should be taken to minimize airborne generation of particulate and avoid contamination of air and water.

Emergency Measures: Isolate area. Keep unnecessary personnel away.

Environmental Precautions: If released into the environment, do not allow to enter sewage systems or penetrate ground or soil. See Section 13 for disposal information.

7. HANDLING AND STORAGE

Precaution for Safe Handling: See Section 8 for information on personal protective equipment. Handle in a well ventilated area. Avoid contact with skin and eyes. Wash face and hands thoroughly before eating or smoking. Use appropriate work gloves when handling castings. Use protective apron and gauntlets if cutting or welding this material

STORAGE: Store in a sealed container. Store in a cool dry area. Do not store together with oxidizers, acids or halogens.

8. EXPOSURE CONTROLS, PERSONAL PROTECTIVE EQUIPMENT

<u>ELEMENT</u>	<u>CAS#</u>	<u>OSHA / P. E. L.</u> ⁽¹⁾
COPPER (Cu) ⁽⁴⁾	7440-50-8	1.0 dust & mists, 0.1 fume
IRON (Fe)	7439-89-6	10 oxide fume
NICKEL (Ni) ^{(4) (5)}	7440-02-0	1 nickel metal
COBALT (Co) ⁽⁴⁾	7440-48-4	0.05 dust & fume



Safety Data Sheet

Product Name: C17000, C17200, C17500, C17510, CCNB Alloys

Version: 1.0

Page 4 of 7

SILICON (Si)	7440-21-3	10 Total Dust
BERYLLIUM (Be) ^{(2) (5)}	7440-41-7	0.0002 mg/m³
ALUMINUM (Al)	7429-90-5	15 Dust/5 Fume

(1) Permissible Exposure Limits are expressed in milligrams per cubic meter of air (mg/m³), unless noted.

(2) ug = microgram (one millionth of a gram; 10⁻⁶ gram)

(3) CL = Ceiling limit, not to be exceeded

(4) Is listed as a toxic chemical and requires reporting under Section 313 of the Community Right-To-Know Act.

(5) Item is suspected carcinogens in humans.

ENGINEERING MEASURES:

Where feasible, enclose processes to prevent dust dispersion into work areas. Use sufficient ventilation to keep concentrations of dust and fumes below safe exposure guidelines (TWA / PEL) outlined by OSHA Beryllium Standard 1910.1024. Whenever possible use of local exhaust ventilation or other engineering controls is the preferred method of controlling exposure to airborne particulate. Check ventilation equipment regularly to ensure it is functioning properly. Provide training on the use and operation of ventilation to all users. Machining operations performed under a liquid lubricant/coolant flood can assist in reducing airborne particulate

PERSONAL PROTECTIVE EQUIPMENT: RESPIRATORS:

If safe exposure guidelines are not met, use approved respirators for dusts or fumes; see OSHA website, www.osha.gov for Beryllium Standard, 29 CFR 1910.1024 and Respiratory Protection Program, 29 CFR 1910.134 requirements/recommendations.

PERSONAL PROTECTIVE EQUIPMENT: EYE PROTECTION:

Wear safety glasses, goggles, face shield, hood or welder's helmet when risk of eye injury is present, particularly during melting, casting, machining, grinding, welding, powder handling, etc. See OSHA www.osha.gov for Eye and Face Protection Program Standard, 29 CFR 1910.133 requirements.

PERSONAL PROTECTIVE EQUIPMENT: HANDS/SKIN/BODY:

Wear impermeable gloves and protective work clothing as necessary.

WORK PRACTICES:

Develop work practices and procedures that prevent particulate from coming in contact with worker skin, hair, or personal clothing. Provide appropriate cleaning/washing facilities. As a standard hygiene practice, always wash hands before eating or smoking. Do not allow food or drink in beryllium work areas.

Reference 29 CFR 1910.1024, Beryllium Standard. Procedures should outline clear communication of the facility's requirements for protective clothing and personal hygiene. These clothing and personal hygiene requirements help keep particulate from being spread to non-production areas or from being taken home by the worker.

Fabrication processes may leave a residue of particulate on the surface of parts, products or equipment that could result in employee exposure during subsequent material handling activities. As necessary, use vacuum systems with high efficiency particulate air (HEPA) filters to clean and capture loose particulate from parts between processing steps.

Refrain from using compressed air, brooms or conventional vacuum cleaners to remove particulate/dust from surfaces or clothing as this activity can result in elevated exposures to airborne particulate



Safety Data Sheet

Product Name: C17000, C17200, C17500, C17510, CCNB Alloys

Version: 1.0

Page 5 of 7

OTHER PROTECTIVE EQUIPMENT:

Protective over garments or work clothing should be worn by persons who may come in contact with particulates during activities such as machining, furnace tending, air cleaning equipment filter changes, maintenance, etc.

Contaminated work clothing and over garments should be managed in a controlled manner to prevent secondary exposure to workers or third parties and to prevent the spread of particulates to other area and to prevent particulate from being taken home by workers. This would include protective gloves and the correct eye protection determined by the exposure. See recommendations listed in OSHA Beryllium Standard 29 CFR 1910-1024

9. PHYSICAL AND CHEMICAL PROPERTIES:

APPEARANCE: Solid Metal

COLOR: Copper

ODOR: No odor

MELTING POINT (°F) 1900-1980°F

WATER SOLUBILITY: Not Soluble

SPECIFIC GRAVITY: 8.26 – 8.89

BOILING POINT: N/A

EVAPORATION RATE: N/A

VAPOR DENSITY: N/A

VAPOR PRESSURE: N/A

10: STABILITY AND REACTIVITY

Reactivity	No information known
Chemical Stability	As a solid material is stable under recommended storage conditions
Incompatibility (materials to avoid)	Avoid contact with strong acids, strong bases, sulphur, chlorates, nitrates
Hazardous Decomposition Products	Avoid creating or accumulating dusts/particulates. Avoid high temperatures that may release metal oxide fumes.

11. TOXICOLOGICAL INFORMATION:

Likely Route of Exposure: Product as shipped does not present a hazard. Subsequent operations that may create dust, small particulate or fumes could become an irritant by inhalation or by contact with skin and eyes.

Symptoms of Exposure: May cause skin irritation and dermatitis especially on exposed areas of broken skin where dust may accumulate or rub against skin. May cause eye irritation. May be harmful if swallowed. May be harmful if inhaled. May cause nose, throat irritation and metallic taste. Some individuals become sensitized from repeated contact with metal dusts or fumes, such as copper, nickel and beryllium. Inhalation of dust or fumes in high concentrations may cause irritation of the respiratory system. Some people inhaling low concentrations of beryllium over time may develop chronic beryllium disease/berylliosis.



Safety Data Sheet

Product Name: C17000, C17200, C17500, C17510, CCNB Alloys

Version: 1.0

Page 6 of 7

Acute and Chronic Effects:

Copper (7440-50-8): Copper is a trace element that is essential for human health. Chronic exposure to copper dust can irritate the respiratory tract, nose, mouth and eyes, and cause headaches, dizziness, nausea and diarrhea. Ingestion of excessive amounts of copper may cause gastrointestinal distress. Chronic ingestion may damage the liver and kidneys.

Acute Toxicity: No data

Carcinogenicity: **NTP:** Not identified as carcinogenic **IARC:** Not identified as carcinogenic

Iron (7439-89-6): Chronic inhalation of finely divided iron powder may cause chronic iron poisoning and pathological deposition of iron in the body tissue. Ingestion may cause vomiting, diarrhea, pink urine, black stool, and liver damage.

Acute Toxicity: LD50 Oral - rat - 30,000mg/kg

Carcinogenicity: **NTP:** Not identified as carcinogenic **IARC:** Not identified as carcinogenic

Nickel (7440-02-0): The most common harmful health effect of metallic nickel in humans is an allergic skin reaction in those who are sensitive to nickel. Although nickel compounds are known human carcinogens, the evidence suggests that the relatively insoluble metallic nickel is less likely to present a carcinogenic hazard than are the nickel compounds that tend to release proportionately more nickel ion.

Acute Toxicity: No data

Carcinogenicity: **NTP:** R - reasonably anticipated to be a human carcinogen **IARC:** 2B - possibly carcinogenic to humans

Cobalt (7440-48-4): Acute exposure to cobalt metal dusts or fumes is characterized by irritation to the eyes, and to a lesser extent, irritation to the skin. Chronic exposure to cobalt metal dust or fumes may cause respiratory and dermatologic signs and symptoms. Chronic exposure to cobalt by inhalation in humans results in effects on the respiratory system, such as respiratory irritation, wheezing, asthma, decreased lung function, pneumonia, and fibrosis.

Acute Toxicity: LD50 Oral - rat - 6,171mg/kg

Carcinogenicity: **NTP:** Not identified as carcinogenic **IARC:** 2B - Possibly carcinogenic to humans

Silicon (7440-21-3): Inhalation or contact with silicon dusts may cause irritation. There is no available data to show any toxic effects for elemental silicon.

Acute Toxicity: No data

Carcinogenicity: **NTP:** Not identified as carcinogenic **IARC:** Not identified as carcinogenic

Beryllium (7440-41-7): Some people inhaling low concentrations of beryllium develop chronic beryllium disease, a granulomatous lung disease characterized by dyspnea, cough, reduced pulmonary function, and a variety of other symptoms including weight loss. The lack of a dose-response relationship between the extent of exposure and development of the disease, long latency period between exposure and onset, and the low incidence among beryllium-exposed individuals suggests that the disease may be immune mediated.

Acute Toxicity: No data

Carcinogenicity: **NTP:** K - Known to be carcinogenic **IARC:** 1 - Carcinogenic to humans

Aluminum (7429-90-5): There is strong evidence that aluminum (compounds) can cause irritation following exposure via either inhalation or injection. Modest evidence of an effect exists for reproductive toxicity following oral exposure, for neurological toxicity following either oral or injection exposure, and for bone toxicity following injection exposure. All other effects were judged to be supported by either limited evidence or no clear evidence at all.

The EPA has recommended a Secondary Maximum Contaminant Level (SMCL) of 0.05–0.2 milligrams per liter (mg/L) for aluminum in drinking water. The SMCL is not based on levels that will affect humans or animals. It is based on taste, smell, or color.

Acute Toxicity: No data

Carcinogenicity: **NTP:** Not identified as carcinogenic **IARC:** Not identified as carcinogenic

To the best of our knowledge the chemical, physical and toxicological characteristics of this solid alloy substance are not fully known.

For more information refer to OSHA Beryllium Standard 29 CFR 1910.1024; NIOSH Pocket Chemical Guide

<http://www.cdc.gov/niosh/npg/default.html>, OSHA's Chemical Sampling information

https://www.osha.gov/dts/chemicalsampling/toc/toc_chemsamp.html, and EPA's Technology Transfer Network - Air Toxics Web Site;

Agency for Toxic Substances and Disease Registry (ATSDR), <http://www.atsdr.cdc.gov/>



Safety Data Sheet

Product Name: C17000, C17200, C17500, C17510, CCNB Alloys

Version: 1.0

Page 7 of 7

12. ECOLOGICAL INFORMATION (Non-Mandatory)

A. General Product Information: Data not available for metal alloy solid.

Ecotoxicity: No further relevant information available

Persistence and degradability: No further relevant information available

Bioaccumulative: Metal powders in water or soil may form metal oxides or other metal compounds that could become bioavailable. No further relevant information available

Other Adverse Effects: May be toxic to aquatic organisms.

General Notes: Do not allow material to be released to the environment without proper permits

Additional Ecological Information

This material may be recyclable. Contact your Sales Representative.

13. DISPOSAL CONSIDERATIONS (Non-Mandatory)

Waste Disposal Method: Return metal to reclaimer. This material may be recyclable.

Product: Collected dust from machining, welding, etc. might be considered "hazardous waste" in some circumstances. Consult local, state and federal regulations to ensure proper disposal. Dispose of in accordance with Federal, State and Local regulations.

Packaging: Consult OSHA Beryllium Standard 29 CFR 1910-1024 regarding packaging requirements as well as local, state and federal regulations regarding disposal of this material.

14. TRANSPORTATION INFORMATION (Non-Mandatory)

DOT: Not regulated in solid form.

GHS Communication regulations of the U.S. Occupational Safety and Health Administration require this product to be labeled in accordance with the OSHA 29 CFR 1910.1024 Beryllium Standard.

15. REGULATORY INFORMATION

OSHA Beryllium Standard 29 CFR 1910.124

TSCA Listed: All components are listed in the EPA Toxic Substance Control Act Chemical Substance Inventory

Regulation (EC) No 1272/2008 (CLP): Carcinogenicity, category 1, Specific target organ toxicity, repeated exposure, category 1.

Canada WHMIS Classification (CPR, SOR/88-66):) : Class D, Division 2, Subdivision A - Very toxic material causing other toxic effects, Class D, Division 2, Subdivision B - Toxic material causing other toxic effects.

HMIS Ratings: Health: 1, Chronic **Flammability:** 0 **Physical:** 0

NFPA Ratings: Health: 1, 2 **Flammability:** 0 **Reactivity:** 0

Chemical Safety Assessment: A chemical safety assessment has not been carried out.

16. OTHER INFORMATION

This safety data sheet (SDS) provides information on a specific group of manufactured metal products. Since these metal products may share a common physical nature and constituents, the data presented could be applicable to all alloys identified.

Employers should use this information only as a supplement to other information gathered by them, and should make an independent judgment of suitability of this information to ensure proper use and to protect the health and safety of employees. This information is provided without warranty, expressed or implied, regarding correctness or accuracy. It is the user's responsibility both to determine safe conditions for use of this product and to assume liability for loss, injury, damage or expense resulting from improper use of this product.