



SAFETY DATA SHEET

Section 1 - Products and Suppliers

SDS: BTi-5, BTi-3

Product Identifier: Brazing Alloys are supplied in the form of:

- (a) Flat, sintered powdered foils 400-600 microns (0.016-0.020") thick;
- (b) Pre-alloyed powder -170 mesh (~90 microns), -150 mesh (~100 microns), or -140 mesh (~105 microns);
- (c) Transfer tape consisting of pre-alloyed powder -170 mesh bonded by 6-8% of adhesive;
- (d) Paste consisting of pre-alloyed powder -100 mesh, or -150 mesh, or -170 mesh. Water-polymer, evaporated binder up to 10 wt.%.

Other means of identification:

BTi-5 alloy - Ti balance, (19-21)Zr, (19-21)Ni, (19-21)Cu, <0.5Hf wt.%

BTi-3 alloy - Ti balance, (36.5-38.5)Zr, (9-11)Ni, (14-16)Cu, <1Hf wt.%

Use (and restrictions): Brazing filler metals for joining or repairing metals, ceramics, or carbon-based components.

Supplier and emergency contact information:

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Auburn, MA 01501
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www.aimtek.com

SDS Date: June 7, 2018

Section 2 – Hazard Identification

As sold, the braze alloys are solid articles (sintered foils, transfer tapes) or powders, and therefore, are not considered hazardous until used in machining, grinding, melting and brazing operations, during which metal can fume and dust may be generated. Hazardous levels of dust or metal fumes of alloy constituents can create health risks, as described below. The foil and transfer tape products do not have above mentioned hazards.

Classification:

Under the Globally Harmonized System of Classification and Labeling and the US OSHA Hazard Communication Standard, dust and fumes released during brazing operations are categorized as hazardous.

Signal word, symbols, hazard and precautionary statements:



Hazard Statements: .

Foils and transfer tape are not flammable solids. When using foils in manufacture do not breathe in dust or fumes.

The powder with particle size equal to or greater than 40 microns is not flammable without further processing. This material has particle size ~90 microns (-170 mesh) and larger.

Possible skin sensitizer or irritant when processed or operated on.

Precautionary Statements:

Obtain special instructions before use. Do not handle until all safety precautions have been read and understood.

Do not breathe dust or fumes. Wear protective gloves to prevent skin contact or thermal burns during brazing operations. Wash hands thoroughly after handling. Do not eat, drink or smoke when using this product.

Keep away from heat/sparks/open flames/hot surfaces - No smoking.

Do not use internally.

If inhaled: Call a doctor if you feel unwell.

If on skin: Wash with plenty of water. If skin irritation or rash occurs: Get medical advice/attention.

If exposed, concerned, or feel unwell: Get medical advice/attention.

Other information about health hazards: Dust and fumes generated during brazing operations can cause skin and eye irritation.

These materials in this product are not normally absorbed through the skin. Repeated or prolonged exposure to elevated concentrations of any airborne dust or fume can irritate or harm the respiratory system, especially as an aggravation to a pre-existing condition. Inhalation of significant quantities of very fine metal dust and metal fumes can cause "metal fume fever," with flu-like symptoms. Avoid creating and breathing airborne dust and fumes.

Other information about physical hazards: Brazing operations can present a fire hazard to nearby combustible materials. Maintain good housekeeping.

Section 3 – Composition/Information on Ingredients

Chemical Identity of Components	CAS#	OSHA PEL	ACGIH TLV
Titanium	7440-32-6	15 mg/m ³ (dust)	10 mg/m ³
Zirconium	7440-67-7	5 mg/m ³ (dust)	5 mg/m ³
Copper	7440-50-8	1.0 mg/m ³ (dust)	1 mg/m ³
Nickel	7440-02-0	1.0 mg/m ³ (dust)	1.5 mg/m ³
Niobium	7440-03-01	N/E Occupational exposure limits 15 mg/m ³ (dust)	10 mg/m ³ (Inhalable) 3 mg/m ³ (Respirable)

Section 4 – First Aid Measures

Inhalation: Remove affected personnel to an exposure-free environment.

On inhalation of dust, move to fresh air. If not breathing give artificial respiration.

Do not use mouth-to-mouth resuscitation. Keep the individual warm, comfortable and rest.

Skin and eye contact: On contact with skin, wash with soap and running water. If powder is embedded in the skin, no water should be applied, but covered with oil. Seek medical attention immediately. On contact with eyes, flush eyes thoroughly with running water for at least 15 minutes.

Ingestion: Keep the individual warm and comfortable, seek medical attention.

Indication of need for immediate medical attention and special treatment:

Skin contact with hot metals or flames during brazing operations can cause thermal burns. Seek medical attention for severe thermal burns.

Possible Health Effects: The alloy in solid form is generally not considered hazardous. However, if it is in the fine powder form or your process involves, melting, spraying, classification, or other processes that causes a release of dust or fume, then hazardous levels of dust or fume of constituents of this alloy can create a health risk. May cause irritation of the respiratory system.

Route(s) of Entry: Inhalation. External exposure. Skin contact.

Signs and Symptoms of Overexposure: Irritation of the respiratory system.
Skin itch.

Effects of Exposure:

Titanium : Inhalation of dust may cause mild irritation of the respiratory tract.

Inhalation of titanium dioxide dust or fume could produce lung fibrosis and chronic bronchitis.

Zirconium: Inhalation of dust may cause irritation of the respiratory tract.

Copper: Inhalation of dust or fume may cause irritation of the respiratory tract.

Inhalation of the fume may result in symptoms of “Metal Fume Fever” (e.g., chills, fever, and sweating). of the respiratory tract. Ingestion of copper may cause gastro-intestinal upset.

Nickel: Nickel is known sensitizer and may produce allergic reactions.

Seek medical attention if any problems persist.

Section 5 – Fire Fighting Measures

Suitable extinguishing media:

Do not use water or carbon dioxide on a metal dust fire. *Use dry sand, earth, or inert materials suitable for Class D fire to smother fire. If appropriate, isolate fire and allow it to burn out.*

Special fire-fighting procedures:

Use protective clothing and breathing equipment appropriate to the surrounding fire.

Section 6 – Accidental Release Measures

Metal scrap should be collected and contained using normal procedures. Avoid creating dust when cleaning up metal particulates, shavings, powders and granules. Vacuum only with HEPA filtered equipment. Do not use compressed air for clean-up. Some fine metal powders may ignite or explode under specific conditions; avoid creating high airborne dust concentrations and accumulating dust. Appropriate personal protective equipment should be used when cleaning up dust. Recovered material should be placed in sealed containers and recycled for their metal content. Dispose in accordance with applicable waste disposal regulations.

Section 7 – Handling and Storage

Store in closed containers in a cool, dry, well-ventilated, fire-resistant area away from oxidizing agents and sources of heat and ignition. Avoid skin contact; wash hands after handling chemicals. Do not eat, drink or smoke while handling these products. Do not swallow brazing materials. All employees who handle this material should be trained to handle it safely. Maintain good housekeeping practices, such as wet sweeping or vacuuming to remove dust accumulation. Amorphous foils are not flammable and not combustible.

Ventilation and Engineering Control: *Provide sufficient general and local exhaust ventilation to maintain concentration of above mentioned compounds below assigned PEL or TLV. If such ventilation is unavailable use NIOSH-approved air-purifying respirators to protect against exposure.* Personal Protective Accessories: *NIOSH-certified respirators, gloves, and ANSI-approved eye protection glasses with side shields. Use full body clothing. In areas of excessive exposures, provide annual medical evaluation of respiratory systems.*

Section 8 – Exposure Controls and Personal Protection

Exposure limits and guidelines

Chemical Identity of Components	CAS#	ACGIH TLV
Titanium	7440-32-6	10 mg/m ³
Zirconium	7440-67-7	5 mg/m ³
Copper	7440-50-8	1 mg/m ³
Nickel	7440-02-0	1.5 mg/m ³

Other jurisdictions may have different exposure limits and control guideline. Users are advised to consult and comply with local regulations where they exist.

Engineering controls:

Use local exhaust ventilation during brazing operations to minimize or eliminate concentrations of airborne contaminants.

Personal protective equipment:

Use NIOSH-approved respiratory protective equipment if exposures exceed established limits or guidelines.

General hygiene considerations:

Do not eat, drink or smoke when handling these products. Wash hands after handling these products.

Section 9 – Physical and chemical characteristics

Melting range: 835-863°C; Brazing temperature: 880-920°C

Specific gravity: ~6.7 g/cm³ (solid)

Solubility: (Water) Nil.

Appearance and odor: Silvery gray. No odor.

pH: Not applicable

Section 10 – Stability and Reactivity

Braze alloy products are stable in air, in water, and when stored in closed containers at room temperature under normal storage and handling conditions. Heating to elevated temperatures may liberate metal/metal oxide fumes (i.e., during brazing operations). Avoid open flames around fine metal powders, pastes, and thin sheets. Metals in particulate form are typically incompatible with strong acids and strong oxidizing agents. Metal powder mixtures can cause fires and explosions (if present at high airborne concentrations).

Incompatibility (Materials to avoid): *Acids*

Hazardous Decomposition or Byproducts: *None known*

Hazardous Polymerization: *Will not occur*

Section 11 – Toxicological Information

User-generated dusts and fumes may, on contact with the skin or eyes produce mechanical irritation. Chronic exposures could cause dermatitis (skin) or conjunctivitis (eyes). Excessive inhalation of powders or user generated fumes from welding/ brazing with these products can, depending on the specific features of the process used, pose a long-term health hazard. The composition of fumes and gases generated in user operations will depend on the metal alloy, base metal and the specific process being used and may include metals, metal oxides, carbon monoxide, ozone, and oxides of nitrogen. The International Agency for Research on Cancer classifies free or pure metallic nickel as category 2B: possible carcinogenic to humans. The US Department of Health and Human Services National Toxicology Program classifies pure nickel as reasonably anticipated to be a human carcinogen, based on limited human evidence and laboratory testing of animals. Additional toxicological information is available through the U.S. National Institute for Occupational Safety and Health and the Registry of Toxic Effects of Chemical Substances (RTECS). See: <http://www.cdc.gov/niosh/ipcsneng/nengrtec.html>. Applicable product components and their respective RTECS numbers are listed below:

Titanium XR1700000 (Metal), Zirconium ZH7070000 (Metal),

Nickel QR5950000 (Metal), Copper GL5325000 (Metal)

Hafnium MG4600000 (Metal), Niobium QT9900000 (Metal).

Section 12 – Ecological Information

When used in their intended manner, these products would not be expected to be released to the environment. Adverse effects on ecosystems are not anticipated in normal or recommended conditions of handling, use, storage and disposal. Pure copper is a marine pollutant.

Section 13 – Disposal Considerations

Manage waste materials in accordance with applicable waste and disposal regulations. Whenever possible, try to recycle and reclaim due to the intrinsic value of certain braze alloy constituents. Whatever cannot be saved for recovery or recycling should be shipped to a permitted waste management facility. Process, use or contamination of this product may change the characteristics of the waste and, consequently, how the waste is managed.

Section 14 – Transport Information

Brazing foils are not flammable solids. This powder with particle size equal to or greater than 40 microns is not flammable without further processing. This material has particle size ~90 microns (-170 mesh) and larger.

DOT Shipping Name: Not Regulated

DOT Hazard Class: N/A

UN Number: N/A

DOT Labels Required (49CFR172.101): N/A

IATA Shipping Name: Not Regulated

IATA Hazard Class: N/A

UN Number: N/A

IATA Hazard Labels: N/A

Section 15 – Regulatory Information

- The nickel component of these brazing products is listed in individual form on the U.S. Toxic Substances Control Act (TSCA) inventory.
- Certain braze alloy products containing nickel are subject to the reporting requirements of Section 313 of the U.S. Emergency Planning and Community Right-to-Know Act (SARA Title III). Refer to Table 1 in Section 16 for applicable products.
- Metallic nickel is listed on the list of “Chemicals known to the State of California to cause cancer or reproductive toxicity” only in the powder form.

Section 16 – Other Information

Revision Summary: June 7, 2017: New SDS to include braze alloy products that contain titanium. The data contained in this Safety Data Sheet relates only to the specific material designated herein and does not relate to use in combination with other materials or processes. Reasonable care has been taken in the preparation of the information contained in this SDS. However, Aimtek, Inc. assumes no responsibility as to the accuracy or suitability of such information and no warranty, expressed or implied, is made.

Section 17 - Notes

- A. The data contained in this Safety Data Sheet relates only to the specific material designated herein and does not relate to use in combination with other materials or processes.
- B. Reasonable care has been taken in the preparation of the information contained in this SDS.

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