



# SAFETY DATA SHEET

Issue Date 11-Aug-2016

Revision Date 15-Dec-2020

Version 2

## Section 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

### 1.1. Product identifier

**Product Code** PM020  
**Product Name** Titanium Brazing Alloy B

**Synonyms** Titanium brazing alloy, including but not limited to: Ti Braze Alloy, Ti-15-15, Ti-15-25  
Contains Cobalt, Nickel

### 1.2. Relevant identified uses of the substance or mixture and uses advised against

**Recommended Use** Alloy product manufacture

**Uses advised against**

### 1.3. Details of the supplier of the safety data sheet

**Manufacturer**  
ATI, 1000 Six PPG Place, Pittsburgh, PA 15222 USA

### 1.4. Emergency telephone number

**Emergency Telephone** Chemtrec: +1-703-741-5970

## Section 2: HAZARDS IDENTIFICATION

This material is classified per Regulation (EC) No 1272/2008.

### 2.1. Classification of the substance or mixture *Regulation (EC) No 1272/2008*

Acute toxicity - Oral	Category 4
Skin sensitisation	Category 1
Carcinogenicity	Category 2
Specific target organ toxicity — repeated exposure	Category 1
Chronic aquatic toxicity	Category 3

### 2.2. Label elements

#### Emergency Overview

**Danger**

**Hazard statements**

Harmful if swallowed  
Suspected of causing cancer  
Causes damage to the respiratory tract through prolonged or repeated exposure if inhaled  
May cause an allergic skin reaction  
Harmful to aquatic life with long lasting effects

**Appearance** Powder**Physical state** Solid**Odour** Odourless**Precautionary Statements - Prevention**

Do not handle until all safety precautions have been read and understood  
 Use personal protective equipment as required  
 Wear protective gloves  
 Wash hands thoroughly after handling  
 Do not eat, drink or smoke when using this product  
 Avoid breathing dust/fume  
 Avoid release to the environment

**Precautionary Statements - Response**

IF INHALED: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing  
 IF ON SKIN: Wash with plenty of soap and water  
 Wash contaminated clothing before reuse  
 If skin irritation or rash occurs: Get medical advice/attention  
 IF SWALLOWED: Call a POISON CENTER or doctor if you feel unwell

**Precautionary Statements - Disposal**

Dispose of contents/container to an approved waste disposal plant

**2.3 Hazards not otherwise classified (HNOC)**

Not applicable

**Other Information**

When product is subjected to welding, burning, melting, sawing, brazing, grinding, buffing, polishing, or other similar heat-generating processes, the following potentially hazardous airborne particles and/or fumes may be generated: Titanium dioxide, an IARC Group 2B carcinogen. Zinc, copper, magnesium, or cadmium fumes may cause metal fume fever.

## Section 3: COMPOSITION/INFORMATION ON INGREDIENTS

**3.1 Substances****Synonyms**

Titanium brazing alloy, including but not limited to: Ti Braze Alloy, Ti-15-15, Ti-15-25.

Chemical Name	EC No	CAS No	Weight-%
Titanium	231-142-3	7440-32-6	60 - 90
Nickel	231-111-4	7440-02-0	5 - 30
Copper	231-159-6	7440-50-8	5 - 20

## Section 4: FIRST AID MEASURES

**4.1. Description of first aid measures****Inhalation**

If excessive amounts of smoke, fume, or particulate are inhaled during processing, remove to fresh air and consult a qualified health professional.

**Skin Contact**

Wash off immediately with soap and plenty of water. In the case of skin allergic reactions see a doctor.

**Eye contact** In the case of particles coming in contact with eyes during processing, treat as with any foreign object.

**Ingestion** IF SWALLOWED. Call a POISON CENTER or doctor/physician if you feel unwell.

#### **4.2. Most important symptoms and effects, both acute and delayed**

**Symptoms** May cause allergic skin reaction. May cause acute gastrointestinal effects if swallowed.

#### **4.3. Indication of any immediate medical attention and special treatment needed**

**Note to doctors** Treat symptomatically.

## **Section 5: FIREFIGHTING MEASURES**

### **5.1. Extinguishing media**

#### **Suitable extinguishing media**

Product not flammable in the form as distributed, flammable as finely divided particles or pieces resulting from processing of this product. Isolate large fires and allow to burn out. Smother small fires with salt (NaCl).

#### **Unsuitable extinguishing media**

Do not spray water on burning metal as an explosion may occur. This explosive characteristic is caused by the hydrogen and steam generated by the reaction of water with the burning material

### **5.2. Special hazards arising from the substance or mixture**

Intense heat. WARNING: Fine particles of this product may form combustible dust-air mixtures. Keep particles away from all ignition sources including heat, sparks, and flame. Prevent dust accumulations to minimise combustible dust hazard

**Hazardous combustion products** Titanium dioxide, an IARC Group 2B carcinogen. Zinc, copper, magnesium, or cadmium fumes may cause metal fume fever.

### **5.3. Advice for firefighters**

Firefighters should wear self-contained breathing apparatus and full firefighting turnout gear.

## **Section 6: ACCIDENTAL RELEASE MEASURES**

### **6.1. Personal precautions, protective equipment and emergency procedures**

#### **Personal precautions**

Use personal protective equipment as required.

#### **For emergency responders**

Use personal protective equipment as required. Follow Emergency Response Guidebook, Guide No. 171, EXCEPT for FIRE follow Emergency Response Guidebook, Guide No. 170.

### **6.2. Environmental precautions**

Collect spillage to prevent release to the environment.

### **6.3. Methods and material for containment and cleaning up**

**Methods for containment** Prevent further leakage or spillage if safe to do so.

**Methods for cleaning up** Sweep or shovel material into dry containers. Avoid creating uncontrolled dust.

### **6.4. Reference to other sections**

See Section 12: ECOLOGICAL INFORMATION.

## Section 7: HANDLING AND STORAGE

### 7.1. Precautions for safe handling

#### Advice on safe handling

WARNING: Fine particles of this product may form combustible dust-air mixtures. Keep particles away from all ignition sources including heat, sparks, and flame. Prevent dust accumulations to minimise combustible dust hazard.

#### General Hygiene Considerations

Handle in accordance with good industrial hygiene and safety practice.

### 7.2. Conditions for safe storage, including any incompatibilities

#### Storage Conditions

Keep away from heat, sparks, flame and other sources of ignition (i.e., pilot lights, electric motors and static electricity).

#### Incompatible materials

Dissolves in hydrofluoric acid. Ignites in the presence of fluorine. When heated above 200°C, reacts exothermically with the following. Chlorine, bromine, halocarbons, carbon tetrachloride, carbon tetrafluoride, and freon.

### 7.3. Specific end use(s)

#### Risk Management Methods (RMM)

The information required is contained in this Safety Data Sheet.

## Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

### 8.1. Control parameters

Chemical Name	European Union	United Kingdom	France	Spain	Germany
Titanium 7440-32-6	-	-	-	-	-
Nickel 7440-02-0	-	STEL: 1.5 mg/m <sup>3</sup> TWA: 0.5 mg/m <sup>3</sup>	TWA: 1 mg/m <sup>3</sup>	TWA: 1 mg/m <sup>3</sup>	Skin
Copper 7440-50-8	-	STEL: 0.6 mg/m <sup>3</sup> STEL: 2 mg/m <sup>3</sup> TWA: 0.2 mg/m <sup>3</sup> TWA: 1 mg/m <sup>3</sup>	TWA: 0.2 mg/m <sup>3</sup> TWA: 1 mg/m <sup>3</sup> STEL: 2 mg/m <sup>3</sup>	TWA: 0.2 mg/m <sup>3</sup> TWA: 1 mg/m <sup>3</sup>	TWA: 0.1 mg/m <sup>3</sup> Ceiling / Peak: 0.2 mg/m <sup>3</sup>
Chemical Name	Italy	Portugal	Netherlands	Finland	Denmark
Titanium 7440-32-6	-	-	-	-	-
Nickel 7440-02-0	-	TWA: 1.5 mg/m <sup>3</sup>	-	TWA: 1 mg/m <sup>3</sup> TWA: 0.1 mg/m <sup>3</sup>	TWA: 0.05 mg/m <sup>3</sup>
Copper 7440-50-8	-	TWA: 0.2 mg/m <sup>3</sup> TWA: 1 mg/m <sup>3</sup>	TWA: 0.1 mg/m <sup>3</sup>	TWA: 1 mg/m <sup>3</sup> TWA: 0.1 mg/m <sup>3</sup>	TWA: 1.0 mg/m <sup>3</sup> TWA: 0.1 mg/m <sup>3</sup>
Chemical Name	Austria	Switzerland	Poland	Norway	Ireland
Titanium 7440-32-6	-	-	STEL: 30 mg/m <sup>3</sup> TWA: 10 mg/m <sup>3</sup>	-	-
Nickel 7440-02-0	-	TWA: 0.5 mg/m <sup>3</sup>	TWA: 0.25 mg/m <sup>3</sup>	TWA: 0.05 mg/m <sup>3</sup> STEL: 0.15 mg/m <sup>3</sup>	TWA: 0.5 mg/m <sup>3</sup>
Copper 7440-50-8	STEL 4 mg/m <sup>3</sup> STEL 0.4 mg/m <sup>3</sup> TWA: 1 mg/m <sup>3</sup> TWA: 0.1 mg/m <sup>3</sup>	STEL: 0.2 mg/m <sup>3</sup> TWA: 0.1 mg/m <sup>3</sup>	TWA: 0.2 mg/m <sup>3</sup>	TWA: 0.1 mg/m <sup>3</sup> TWA: 1 mg/m <sup>3</sup> STEL: 0.3 mg/m <sup>3</sup> STEL: 3 mg/m <sup>3</sup>	TWA: 0.2 mg/m <sup>3</sup> TWA: 1 mg/m <sup>3</sup> STEL: 2 mg/m <sup>3</sup>

**Derived No Effect Level (DNEL)** No DNELs are available for this product as a whole

**Predicted No Effect Concentration (PNEC)** No PNECs are available for this product as a whole.

### 8.2. Exposure controls

**Engineering Controls** Avoid generation of uncontrolled particles.

**Personal protective equipment**

<b>Eye/face protection</b>	When airborne particles may be present, appropriate eye protection is recommended. For example, tight-fitting goggles, foam-lined safety glasses or other protective equipment that shield the eyes from particles.
<b>Skin and body protection</b>	Fire/flame resistant/retardant clothing may be appropriate during hot work with the product. Wear protective gloves.
<b>Respiratory protection</b>	When particulates/fumes/gases are generated and if exposure limits are exceeded or irritation is experienced, proper approved respiratory protection should be worn. Positive-pressure supplied air respirators may be required for high airborne contaminate concentrations. Respiratory protection must be provided in accordance with current local regulations.

**Environmental exposure controls** Section 6: ACCIDENTAL RELEASE MEASURES.

**Section 9: PHYSICAL AND CHEMICAL PROPERTIES**
**9.1. Information on basic physical and chemical properties**

<b>Physical state</b>	Solid	<b>Odour</b>	Odourless
<b>Appearance</b>	Powder	<b>Odour threshold</b>	Not applicable
<b>Colour</b>	metallic, grey or Silver		
<b>Property</b>	<b>Values</b>	<b>Remarks • Method</b>	
<b>pH</b>	-	Not applicable	
<b>Melting point / freezing point</b>	870 °C / 1600 °F		
<b>Boiling point / boiling range</b>	-		
<b>Flash point</b>	-		
<b>Evaporation rate</b>	-	Not applicable	
<b>Flammability (solid, gas)</b>	-	Product not flammable in the form as distributed, flammable as finely divided particles or pieces resulting from processing of this product	
<b>Flammability Limit in Air</b>			
<b>Upper flammability limit:</b>		-	
<b>Lower flammability limit</b>		-	
<b>Vapour pressure</b>	-	Not applicable	
<b>Vapour density</b>	-	Not applicable	
<b>Specific Gravity</b>	6.1		
<b>Water solubility</b>	Insoluble		
<b>Solubility(ies)</b>	-		
<b>Partition coefficient</b>	-	Not applicable	
<b>Autoignition temperature</b>	-	Not applicable	
<b>Decomposition temperature</b>	-	Not applicable	
<b>Kinematic viscosity</b>	-	Not applicable	
<b>Dynamic viscosity</b>	-	Not applicable	
<b>Explosive properties</b>	Not applicable		
<b>Oxidising properties</b>	Not applicable		

**9.2. Other information**

<b>Softening point</b>	-
<b>Molecular weight</b>	-
<b>VOC Content (%)</b>	Not applicable
<b>Density</b>	-
<b>Bulk density</b>	-

**Section 10: STABILITY AND REACTIVITY**
**10.1. Reactivity**

Not applicable

**10.2. Chemical stability**

Stable under normal conditions.

Explosion data

Sensitivity to Mechanical Impact None.  
Sensitivity to Static Discharge None.

**10.3. Possibility of hazardous reactions**

**Hazardous polymerisation**

Hazardous polymerisation does not occur.

**Possibility of Hazardous Reactions**

None under normal processing.

**10.4. Conditions to avoid**

Dust formation and dust accumulation.

**10.5. Incompatible materials**

Dissolves in hydrofluoric acid. Ignites in the presence of fluorine. When heated above 200°C, reacts exothermically with the following. Chlorine, bromine, halocarbons, carbon tetrachloride, carbon tetrafluoride, and freon.

**10.6. Hazardous decomposition products**

When product is subjected to welding, burning, melting, sawing, brazing, grinding, buffing, polishing, or other similar heat-generating processes, the following potentially hazardous airborne particles and/or fumes may be generated:: Titanium dioxide, an IARC Group 2B carcinogen.

## Section 11: TOXICOLOGICAL INFORMATION

**11.1. Information on toxicological effects**

**Product Information**

<b>Inhalation</b>	Suspected of causing cancer if inhaled. Causes damage to the respiratory tract through prolonged or repeated exposure if inhaled.
<b>Eye contact</b>	Product not classified.
<b>Skin Contact</b>	May cause sensitisation by skin contact.
<b>Ingestion</b>	Harmful if swallowed.
<b>Unknown Acute Toxicity</b>	

Chemical Name	Oral LD50	Dermal LD50	Inhalation LC50
Titanium	> 5000 mg/kg bw	-	-
Nickel	> 9000 mg/kg bw	-	> 10.2 mg/L
Copper	481 mg/kg bw	>2000 mg/kg bw	>5.11 mg/L

**Information on toxicological effects**

**Symptoms** May cause acute gastrointestinal effects if swallowed. May cause sensitisation by skin contact.

**Delayed and immediate effects as well as chronic effects from short and long-term exposure**

<b>Acute toxicity</b>	Harmful if swallowed.
<b>Skin corrosion/irritation</b>	Product not classified.
<b>Serious eye damage/eye irritation</b>	Product not classified.
<b>Sensitisation</b>	May cause sensitisation by skin contact.
<b>Germ cell mutagenicity</b>	Product not classified.

**Carcinogenicity** May cause cancer by inhalation.

Chemical Name	ACGIH	IARC	NTP	OSHA
Nickel 7440-02-0		Group 1 Group 2B	Known Reasonably Anticipated	X

**Reproductive toxicity** Product not classified.

**STOT - single exposure** Product not classified.

**STOT - repeated exposure** Causes disorder and damage to the: Respiratory System.

**Aspiration hazard** Product not classified.

## Section 12: ECOLOGICAL INFORMATION

### 12.1. Toxicity

This product contains a chemical which is listed as a severe marine pollutant according to IMDG/IMO

This product as shipped is classified for aquatic chronic toxicity

Chemical Name	Algae/aquatic plants	Fish	Toxicity to microorganisms	Crustacea
Titanium	The 72 h EC50 of titanium dioxide to <i>Pseudokirchnerella subcapitata</i> was 61 mg of TiO <sub>2</sub> /L.	The 96 h LC50 of titanium dioxide to <i>Cyprinodon variegatus</i> was greater than 10,000 mg of TiO <sub>2</sub> /L. The 96 h LC50 of titanium dioxide to <i>Pimephales promelas</i> was greater than 1,000 mg of TiO <sub>2</sub> /L.	The 3 h EC50 of titanium dioxide for activated sludge were greater than 1000 mg/L.	The 48 h EC50 of titanium dioxide to <i>Daphnia Magna</i> was greater than 1000 mg of TiO <sub>2</sub> /L.
Nickel	NOEC/EC10 values range from 12.3 µg/l for <i>Scenedesmus acuminatus</i> to 425 µg/l for <i>Pseudokirchnerella subcapitata</i> .	The 96h LC50s values range from 0.4 mg Ni/L for <i>Pimephales promelas</i> to 320 mg Ni/L for <i>Brachydanio rerio</i> .	The 30 min EC50 of nickel for activated sludge was 33 mg Ni/L.	The 48h LC50s values range from 0.013 mg Ni/L for <i>Ceriodaphnia dubia</i> to 4970 mg Ni/L for <i>Daphnia magna</i> .
Copper	The 72 h EC50 values of copper chloride to <i>Pseudokirchnerella subcapitata</i> ranged between 30 µg/L (pH 7.02, hardness 250 mg/L CaCO <sub>3</sub> , DOC 1.95 mg/L) and 824 µg/L (pH 6.22, hardness 100 mg/L CaCO <sub>3</sub> , DOC 15.8 mg/L).	The 96-hr LC50 for <i>Pimephales promelas</i> exposed to Copper sulfate ranged from 256.2 to 38.4 µg/L with water hardness increasing from 45 to 255.7 mg/L.	The 24 h NOEC of copper chloride for activated sludge ranged from 0.32 to 0.64 mg of Cu/L.	The 48 h LC50 values for <i>Daphnia magna</i> exposed to copper in natural water ranged between 33.8 µg/L (pH 6.1, hardness 12.4 mg/L CaCO <sub>3</sub> , DOC 2.34 mg/L) and 792 µg/L (pH 7.35, hardness 139.7 mg/L CaCO <sub>3</sub> , DOC 22.8 mg/L).

### 12.2. Persistence and degradability

### 12.3. Bioaccumulative potential

### 12.4. Mobility in soil

### 12.5. Results of PBT and vPvB assessment

The PBT and vPvB criteria do not apply to inorganic substances.

12.6. Other adverse effects**Section 13: DISPOSAL CONSIDERATIONS**13.1. Waste treatment methods

<b>Waste from residues/unused products</b>	Disposal should be in accordance with applicable regional, national and local laws and regulations.
<b>Contaminated packaging</b>	Disposal should be in accordance with applicable regional, national and local laws and regulations.

**Section 14: TRANSPORT INFORMATION**IMDG

<b>14.1 UN/ID no</b>	-
<b>14.2 Proper shipping name</b>	Regulated per IMDG, if transported in bulk or by vessel
<b>14.3 Hazard Class</b>	9
<b>14.4 Packing Group</b>	III
<b>14.5 Marine pollutant</b>	This product contains a chemical which is listed as a severe marine pollutant according to IMDG/IMO
<b>Environmental hazard</b>	Severe Marine Pollutant: Copper metal powder
<b>14.6 Special Provisions</b>	8, 146, 335, A112, B54, B120, IB8, IP3, N20, N91, T1, TP33
<b>14.7 Transport in bulk according to Annex II of MARPOL and the IBC Code</b>	-

RID

<b>14.1 UN/ID no</b>	Not regulated
<b>14.2 Proper shipping name</b>	Not regulated
<b>14.3 Hazard Class</b>	Not regulated
<b>14.4 Packing Group</b>	Not regulated
<b>14.5 Environmental hazard</b>	.
<b>14.6 Special Provisions</b>	None

ADR

<b>14.1 UN/ID no</b>	Not regulated
<b>14.2 Proper shipping name</b>	Not regulated
<b>14.3 Hazard Class</b>	Not regulated
<b>Subsidiary hazard class</b>	.
<b>14.4 Packing Group</b>	Not regulated
<b>14.5 Environmental hazard</b>	.
<b>14.6 Special Provisions</b>	None

ICAO (air)

<b>14.1 UN/ID no</b>	Not regulated
<b>14.2 Proper shipping name</b>	Not regulated
<b>14.3 Hazard Class</b>	Not regulated
<b>Subsidiary hazard class</b>	.
<b>14.4 Packing Group</b>	Not applicable
<b>14.5 Environmental hazard</b>	.
<b>14.6 Special Provisions</b>	None

IATA

<b>14.1 UN/ID no</b>	Not regulated
<b>14.2 Proper shipping name</b>	Not regulated
<b>14.3 Hazard Class</b>	Not regulated
<b>14.4 Packing Group</b>	Not regulated
<b>Description</b>	-



14.5 Environmental hazard .  
 14.6 Special Provisions None

## Section 15: REGULATORY INFORMATION

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

Chemical Name	French RG number	Title
Titanium 7440-32-6	-	-
Nickel 7440-02-0	RG 37ter	-
Copper 7440-50-8	-	-

#### European Union

Take note of Directive 98/24/EC on the protection of the health and safety of workers from the risks related to chemical agents at work

#### Authorisations and/or restrictions on use:

This product does not contain substances subject to authorisation (Regulation (EC) No. 1907/2006 (REACH), Annex XIV). This product does not contain substances subject to restriction (Regulation (EC) No. 1907/2006 (REACH), Annex XVII).

#### International Inventories

<b>DSL/NDSL</b>	Complies
<b>EINECS/ELINCS</b>	Complies
<b>ENCS</b>	Complies
<b>IECSC</b>	Complies
<b>KECL</b>	Complies
<b>PICCS</b>	Complies
<b>AICS</b>	Complies

#### Legend:

**TSCA** - United States Toxic Substances Control Act Section 8(b) Inventory  
**DSL/NDSL** - Canadian Domestic Substances List/Non-Domestic Substances List  
**EINECS/ELINCS** - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances  
**ENCS** - Japan Existing and New Chemical Substances  
**IECSC** - China Inventory of Existing Chemical Substances  
**KECL** - Korean Existing and Evaluated Chemical Substances  
**PICCS** - Philippines Inventory of Chemicals and Chemical Substances  
**AICS** - Australian Inventory of Chemical Substances

### 15.2. Chemical safety assessment

No chemical safety assessment has been performed for this product.

## Section 16: OTHER INFORMATION

**Issue Date** 11-Aug-2016  
**Revision Date** 15-Dec-2020  
**Revision Note** SDS sections updated: 1, 2, 5, 7, 11, 16.

**This material safety data sheet complies with the requirements of Regulation (EC) No. 1907/2006**

#### Note:

The information provided in this Material Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage,

transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

**End of Safety Data Sheet**

**Additional information available  
from:**

Safety data sheets and labels available at [ATImetals.com](http://ATImetals.com)