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

1.1. Product identifier

Product Code: PM019

Product Name: Titanium Brazing Alloy A

UN/ID no: 3089

Synonyms: Titanium brazing alloy: Ti Braze Alloy, Ti-20-20-20

Contains Cobalt, Nickel

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

Recommended Use: Brazing

Uses advised against:

1.3. Details of the supplier of the safety data sheet

Manufacturer Address: 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

2.1. Classification of the substance or mixture

Regulation (EC) No 1272/2008

<table>
<thead>
<tr>
<th>Hazard Class</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute toxicity - Oral</td>
<td>Category 4</td>
</tr>
<tr>
<td>Skin sensitisation</td>
<td>Category 1</td>
</tr>
<tr>
<td>Carcinogenicity</td>
<td>Category 2</td>
</tr>
<tr>
<td>Specific target organ toxicity (repeated exposure)</td>
<td>Category 1</td>
</tr>
<tr>
<td>Chronic aquatic toxicity</td>
<td>Category 3</td>
</tr>
<tr>
<td>Flammable solids</td>
<td></td>
</tr>
</tbody>
</table>

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
Flammable solid
Precautionary Statements - Prevention
Do not handle until all safety precautions have been read and understood
Use personal protective equipment as required
Wear protective gloves/protective clothing/eye protection
Keep away from heat/sparks/open flames/hot surfaces. - No smoking
Ground/bond container and receiving equipment
If dust clouds can occur, use explosion-proof electrical/ ventilating/lighting/equipment
Wash hands thoroughly after handling
Do not eat, drink or smoke when using this product
Avoid breathing dust/fume
Avoid release to the environment
If skin irritation or rash occurs: Get medical advice/attention
Wash contaminated clothing before reuse
IF ON SKIN: Wash with plenty of soap and water
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell
In case of fire: Use salt (NaCl) or class D dry powder for extinction
Collect spillage

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: zinc, copper,
magnesium, or cadmium fumes may cause metal fume fever; Titanium dioxide, an IARC Group 2B carcinogen.

Section 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Synonyms
Titanium brazing alloy: Ti Braze Alloy, Ti-20-20-20.

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>EC No</th>
<th>CAS No</th>
<th>Weight-%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Titanium</td>
<td>231-142-3</td>
<td>7440-32-6</td>
<td>60 - 90</td>
</tr>
<tr>
<td>Nickel</td>
<td>231-111-4</td>
<td>7440-02-0</td>
<td>0 - 25</td>
</tr>
<tr>
<td>Zirconium</td>
<td>231-176-9</td>
<td>7440-67-7</td>
<td>0 - 20</td>
</tr>
<tr>
<td>Copper</td>
<td>231-159-6</td>
<td>7440-50-8</td>
<td>0 - 20</td>
</tr>
</tbody>
</table>

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: FIRE FIGHTING MEASURES**

#### 5.1. Extinguishing media

**Suitable extinguishing media**
Isolate large fires and allow to burn out. Smother small fires with salt (NaCl) or class D dry powder fire extinguisher.

**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. Very fine, high surface area material resulting from grinding, buffing, polishing, or similar processes of this product may ignite spontaneously at room temperature. **WARNING:** Fine particles resulting from grinding, buffing, polishing, or similar processes 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

Wear self-contained breathing apparatus and protective suit. Use personal protective equipment as required.

---

**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. 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
Very fine, high surface area material resulting from grinding, buffing, polishing, or similar processes of this product may ignite spontaneously at room temperature. WARNING: Fine particles resulting from grinding, buffing, polishing, or similar processes 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). For long-term storage, keep sealed in argon-filled steel drums. Keep tightly closed in a dry and cool place.

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

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>European Union</th>
<th>United Kingdom</th>
<th>France</th>
<th>Spain</th>
<th>Germany</th>
</tr>
</thead>
<tbody>
<tr>
<td>Titanium</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Nickel</td>
<td>-</td>
<td>STEL: 1.5 mg/m³</td>
<td>TWA: 1 mg/m³</td>
<td>TWA: 1 mg/m³</td>
<td>Skin</td>
</tr>
<tr>
<td>Zirconium</td>
<td>-</td>
<td>TWA: 5 mg/m³</td>
<td>-</td>
<td>STEL: 10 mg/m³</td>
<td>TWA: 5 mg/m³</td>
</tr>
<tr>
<td>Copper</td>
<td>STEL: 0.6 mg/m³</td>
<td>TWA: 2 mg/m³</td>
<td>TWA: 0.2 mg/m³</td>
<td>TWA: 0.2 mg/m³</td>
<td>TWA: 1 mg/m³</td>
</tr>
<tr>
<td></td>
<td>TWA: 1 mg/m³</td>
<td>STEL: 2 mg/m³</td>
<td>TWA: 1 mg/m³</td>
<td>TWA: 1 mg/m³</td>
<td>Ceiling / Peak: 1 mg/m³</td>
</tr>
<tr>
<td></td>
<td>TWA: 1 mg/m³</td>
<td>STEL: 2 mg/m³</td>
<td>TWA: 1 mg/m³</td>
<td>TWA: 1 mg/m³</td>
<td>TWA: 0.05 mg/m³</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Italy</th>
<th>Portugal</th>
<th>Netherlands</th>
<th>Finland</th>
<th>Denmark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Titanium</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Nickel</td>
<td>-</td>
<td>TWA: 1.5 mg/m³</td>
<td>-</td>
<td>TWA: 1 mg/m³</td>
<td>TWA: 0.5 mg/m³</td>
</tr>
<tr>
<td>Zirconium</td>
<td>-</td>
<td>STEL: 10 mg/m³</td>
<td>TWA: 5 mg/m³</td>
<td>-</td>
<td>TWA: 5 mg/m³</td>
</tr>
<tr>
<td>Copper</td>
<td>TWA: 0.2 mg/m³</td>
<td>TWA: 1 mg/m³</td>
<td>TWA: 0.1 mg/m³</td>
<td>TWA: 1 mg/m³</td>
<td>TWA: 1.0 mg/m³</td>
</tr>
<tr>
<td></td>
<td>TWA: 1 mg/m³</td>
<td>STEL: 2 mg/m³</td>
<td>TWA: 0.1 mg/m³</td>
<td>TWA: 1 mg/m³</td>
<td>TWA: 0.1 mg/m³</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Austria</th>
<th>Switzerland</th>
<th>Poland</th>
<th>Norway</th>
<th>Ireland</th>
</tr>
</thead>
<tbody>
<tr>
<td>Titanium</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Nickel</td>
<td>-</td>
<td>TWA: 0.5 mg/m³</td>
<td>TWA: 0.25 mg/m³</td>
<td>TWA: 0.05 mg/m³</td>
<td>TWA: 0.15 mg/m³</td>
</tr>
<tr>
<td></td>
<td>TWA: 1 mg/m³</td>
<td>STEL: 30 mg/m³</td>
<td>TWA: 10 mg/m³</td>
<td>TWA: 0.5 mg/m³</td>
<td>TWA: 0.5 mg/m³</td>
</tr>
<tr>
<td>Zirconium 7440-67-7</td>
<td>TWA: 5 mg/m³</td>
<td>TWA: 5 mg/m³</td>
<td>STEL: 0.4 mg/m³</td>
<td>TWA: 1 mg/m³</td>
<td>TWA: 0.1 mg/m³</td>
</tr>
<tr>
<td>---------------------</td>
<td>--------------</td>
<td>--------------</td>
<td>-----------------</td>
<td>--------------</td>
<td>---------------</td>
</tr>
<tr>
<td>Copper 7440-50-8</td>
<td>STEL: 4 mg/m³</td>
<td>STEL: 0.2 mg/m³</td>
<td>TWA: 0.2 mg/m³</td>
<td>TWA: 0.3 mg/m³</td>
<td>STEL: 3 mg/m³</td>
</tr>
<tr>
<td></td>
<td>STEL: 10 mg/m³</td>
<td>TWA: 5 mg/m³</td>
<td>TWA: 10 mg/m³</td>
<td>TWA: 10 mg/m³</td>
<td>STEL: 10 mg/m³</td>
</tr>
</tbody>
</table>

**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 particulates.

**Personal protective equipment**

- **Eye/face protection**
  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.

- **Skin and body protection**
  Wear fire/flame resistant/retardant clothing. Wear protective gloves.

- **Respiratory protection**
  If exposure limits are exceeded or irritation is experienced, NIOSH/MSHA approved respiratory protection should be worn. Positive-pressure supplied air respirators may be required for high airborne contaminant 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

<table>
<thead>
<tr>
<th>Property</th>
<th>Values</th>
<th>Remarks • Method</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Physical state</strong></td>
<td>Solid</td>
<td></td>
</tr>
<tr>
<td><strong>Appearance</strong></td>
<td>Powder</td>
<td>Odour</td>
</tr>
<tr>
<td><strong>Colour</strong></td>
<td>metallic, grey or Silver</td>
<td>Odour threshold</td>
</tr>
<tr>
<td><strong>pH</strong></td>
<td>-</td>
<td></td>
</tr>
<tr>
<td><strong>Melting point/freezing point</strong></td>
<td>870 °C / 1600 °F</td>
<td></td>
</tr>
<tr>
<td><strong>Boiling point / boiling range</strong></td>
<td>-</td>
<td></td>
</tr>
<tr>
<td><strong>Flash point</strong></td>
<td>-</td>
<td></td>
</tr>
<tr>
<td><strong>Evaporation rate</strong></td>
<td>-</td>
<td>Not applicable</td>
</tr>
<tr>
<td><strong>Flammability (solid, gas)</strong></td>
<td>-</td>
<td>Flammable</td>
</tr>
<tr>
<td><strong>Flammability Limit in Air</strong></td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Upper flammability limit:</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Lower flammability limit:</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td><strong>Vapour pressure</strong></td>
<td>-</td>
<td>Not applicable</td>
</tr>
<tr>
<td><strong>Vapour density</strong></td>
<td>-</td>
<td>Not applicable</td>
</tr>
<tr>
<td><strong>Specific Gravity</strong></td>
<td>6.1</td>
<td></td>
</tr>
<tr>
<td><strong>Water solubility</strong></td>
<td>Insoluble</td>
<td></td>
</tr>
<tr>
<td><strong>Solubility(ies)</strong></td>
<td></td>
<td>Not applicable</td>
</tr>
<tr>
<td><strong>Partition coefficient</strong></td>
<td>-</td>
<td>Not applicable</td>
</tr>
<tr>
<td><strong>Autoignition temperature</strong></td>
<td>-</td>
<td>Not applicable</td>
</tr>
<tr>
<td><strong>Decomposition temperature</strong></td>
<td>-</td>
<td>Not applicable</td>
</tr>
<tr>
<td><strong>Kinematic viscosity</strong></td>
<td>-</td>
<td>Not applicable</td>
</tr>
<tr>
<td><strong>Dynamic viscosity</strong></td>
<td>-</td>
<td>Not applicable</td>
</tr>
<tr>
<td><strong>Explosive properties</strong></td>
<td>Not applicable</td>
<td></td>
</tr>
<tr>
<td><strong>Oxidising properties</strong></td>
<td>Not applicable</td>
<td></td>
</tr>
</tbody>
</table>

#### 9.2. Other information

- **Softening point**
- **Molecular weight**
- **VOC Content (%)**
  Not applicable
Density
Bulk density

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

- Inhalation
  Suspected of causing cancer if inhaled. Causes damage to the respiratory tract through prolonged or repeated exposure if inhaled.
- Eye contact
  Product not classified.
- Skin Contact
  Nickel or Cobalt containing alloys may cause sensitisation by skin contact.
- Ingestion
  Harmful if swallowed.

Unknown Acute Toxicity

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Oral LD50</th>
<th>Dermal LD50</th>
<th>Inhalation LC50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Titanium</td>
<td>&gt; 5000 mg/kg bw</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Nickel</td>
<td>&gt; 9000 mg/kg bw</td>
<td>-</td>
<td>&gt; 10.2 mg/L</td>
</tr>
<tr>
<td>Zirconium</td>
<td>&gt; 5000 mg/kg bw</td>
<td>-</td>
<td>&gt; 4.3 mg/L</td>
</tr>
<tr>
<td>Copper</td>
<td>481 mg/kg bw</td>
<td>&gt; 2000 mg/kg bw</td>
<td>&gt; 5.11 mg/L</td>
</tr>
</tbody>
</table>

Information on toxicological effects

Symptoms
May cause acute gastrointestinal effects if swallowed. Nickel or Cobalt containing alloys
may cause sensitisation by skin contact.

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

Acute toxicity
Harmful if swallowed.

Skin corrosion/irritation
Product not classified.

Serious eye damage/eye irritation
Product not classified.

Sensitisation
Nickel or Cobalt containing alloys may cause sensitisation by skin contact.

Germ cell mutagenicity
Product not classified.

Carcinogenicity
May cause cancer by inhalation.

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>ACGIH</th>
<th>IARC</th>
<th>NTP</th>
<th>OSHA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nickel</td>
<td>Group 1</td>
<td>Group 2B</td>
<td>Known</td>
<td>X</td>
</tr>
<tr>
<td>7440-02-0</td>
<td></td>
<td></td>
<td>Reasonably Anticipated</td>
<td></td>
</tr>
</tbody>
</table>

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 as shipped is classified for aquatic chronic toxicity

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Algae/aquatic plants</th>
<th>Fish</th>
<th>Toxicity to Micro-organisms</th>
<th>Crustacea</th>
</tr>
</thead>
<tbody>
<tr>
<td>Titanium</td>
<td>The 72 h EC50 of titanium dioxide to Pseudokirchneriella subcapitata was 61 mg of TiO2/L.</td>
<td>The 96 h LC50 of titanium dioxide to Cyprinodon variegatus was greater than 10,000 mg of TiO2/L.</td>
<td>The 3 h EC50 of titanium dioxide for activated sludge were greater than 1000 mg/L.</td>
<td>The 48 h EC50 of titanium dioxide to Daphnia Magna was greater than 1000 mg of TiO2/L.</td>
</tr>
<tr>
<td>Nickel</td>
<td>NOEC/EC10 values range from 12.3 µg/l for Scenedesmus accuminatus to 425 µg/l for Pseudokirchneriella subcapitata.</td>
<td>The 96 h LC50S values range from 0.4 mg Ni/L for Pimephales promelas to 320 mg Ni/L for Brachydanio rerio.</td>
<td>The 30 min EC50 of nickel for activated sludge was 33 mg Ni/L.</td>
<td>The 48h LC50s values range from 0.013 mg Ni/L for Ceriodaphnia dubia to 4970 mg Ni/L for Daphnia magna.</td>
</tr>
<tr>
<td>Zirconium</td>
<td>The 14 d NOEC of zirconium dichloride oxide to Chlorella vulgaris was greater than 102.5 mg of Zr/L.</td>
<td>The 96 h LL50 of zirconium to Danio rerio was greater than 74.03 mg/L.</td>
<td>-</td>
<td>The 48h EC50 of zirconium dioxide to Daphnia magna was greater than 74.03 mg of Zr/L.</td>
</tr>
<tr>
<td>Copper</td>
<td>The 72 h EC50 values of copper chloride to Pseudokirchneriella subcapitata ranged between 30 µg/l (pH 7.02, hardness 250 mg/L CaCO3, DOC 1.95 mg/L) and 824 µg/l (pH 6.22, hardness 100 mg/L CaCO3, DOC 15.8 mg/L).</td>
<td>The 96-hr LC50 for Pimephales promelas exposed to Copper sulfate ranged from 256.2 to 38.4 µg/L with water hardness increasing from 45 to 255.7 mg/L.</td>
<td>The 24 h NOEC of copper chloride for activated sludge ranged from 0.32 to 0.64 mg of Cu/L.</td>
<td>The 48 h LC50 values for Daphnia magna exposed to copper in natural water ranged between 33.8 µg/L (pH 6.1, hardness 12.4 mg/L CaCO3, DOC 2.34 mg/L) and 792 µg/L (pH 7.35, hardness 139.7 mg/L CaCO3, DOC 22.8 mg/L).</td>
</tr>
</tbody>
</table>
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

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

Contaminated packaging
Disposal should be in accordance with applicable regional, national and local laws and regulations.

Section 14: TRANSPORT INFORMATION

IMDG
14.1 UN/ID no 3089
14.2 Proper shipping name Metal powders, flammable, n.o.s. (Titanium)
14.3 Hazard Class 4.1
14.4 Packing Group II
14.5 Marine pollutant This product contains a chemical which is listed as a severe marine pollutant according to IMDG/IMO Environmental hazard Yes
14.6 Special Provisions IB8, IP2, IP4, T3, TP33
14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

RID
14.1 UN/ID no 3089
14.2 Proper shipping name Metal powders, flammable, n.o.s. (Titanium)
14.3 Hazard Class 4.1
14.4 Packing Group II
14.5 Environmental hazard Yes
14.6 Special Provisions IB8, IP2, IP4, T3, TP33

ADR
14.1 UN/ID no 3089
14.2 Proper shipping name Metal powders, flammable, n.o.s. (Titanium)
14.3 Hazard Class 4.1
14.4 Packing Group II
14.5 Environmental hazard Yes
14.6 Special Provisions IB8, IP2, IP4, T3, TP33
Section 15: REGULATORY INFORMATION

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

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>French RG number</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Titanium</td>
<td>7440-32-6</td>
<td>-</td>
</tr>
<tr>
<td>Nickel</td>
<td>7440-02-0</td>
<td>RG 37ter</td>
</tr>
<tr>
<td>Zirconium</td>
<td>7440-67-7</td>
<td>-</td>
</tr>
<tr>
<td>Copper</td>
<td>7440-50-8</td>
<td>-</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Inventory</th>
<th>Complies</th>
</tr>
</thead>
<tbody>
<tr>
<td>DSL/NDSL</td>
<td></td>
</tr>
<tr>
<td>EINECS/ELINCS</td>
<td></td>
</tr>
<tr>
<td>ENCS</td>
<td></td>
</tr>
<tr>
<td>IECSC</td>
<td></td>
</tr>
<tr>
<td>KECL</td>
<td></td>
</tr>
<tr>
<td>PICCS</td>
<td></td>
</tr>
<tr>
<td>AICS</td>
<td></td>
</tr>
</tbody>
</table>

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**

**Full text of H-Statements referred to under section 3**
- H317 - May cause an allergic skin reaction
- H351 - Suspected of causing cancer if inhaled
- H372 - Causes damage to organs through prolonged or repeated exposure if inhaled
- H334 - May cause allergy or asthma symptoms or breathing difficulties if inhaled
- H413 - May cause long lasting harmful effects to aquatic life

**Issue Date**  
11-Aug-2016

**Revision Date**  
11-Aug-2016

**Revision Note**  
Updated to comply with GHS.

**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.

**Additional information available from:**  
Safety data sheets and labels available at ATImetals.com

**End of Safety Data Sheet**