1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

Product identifier
Product Name Processed Titanium Condensate
Other means of identification
Product Code SAC101
Synonyms

Recommended use of the chemical and restrictions on use
Recommended Use Alloy product manufacture.
Uses advised against

Details of the supplier of the safety data sheet
Manufacturer Address ATI, 1000 Six PPG Place, Pittsburgh, PA 15222 USA
Emergency telephone number Chemtrec: 1-800-424-9300

2. HAZARDS IDENTIFICATION

Classification
This material is not considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Label elements

<table>
<thead>
<tr>
<th>Appearance</th>
<th>Physical state</th>
<th>Odor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Various blends of powders and chunks</td>
<td>Solid</td>
<td>Odorless</td>
</tr>
</tbody>
</table>

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. Vanadium pentoxide (V2O5) affects eyes, skin, respiratory system.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Synonyms

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS No.</th>
<th>Weight-%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Titanium</td>
<td>7440-32-6</td>
<td>20 - 90</td>
</tr>
</tbody>
</table>
Titanium Dioxide 13463-67-7 0 - 70
Aluminum 7429-90-5 0 - 65
Aluminum Oxide 1344-28-1 0 - 60
Titanium Nitride 25583-20-4 0 - 40
Aluminum Nitride 24304-00-5 0 - 5
Vanadium 7440-62-2 0 - 3
Iron 7439-89-6 0 - 2
Titanium Carbonitride 12654-86-3 0 - 1

4. FIRST AID MEASURES

First aid measures

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

Skin Contact
None under normal use conditions.

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

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

Most important symptoms and effects, both acute and delayed

Symptoms
None anticipated.

Indication of any immediate medical attention and special treatment needed

Note to physicians
Treat symptomatically.

5. FIRE-FIGHTING MEASURES

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.

Specific hazards arising from the chemical
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 minimize combustible dust hazard.

Hazardous combustion products
Titanium dioxide an IARC Group 2B carcinogen. Vanadium pentoxide (V2O5) affects eyes, skin, respiratory system.

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

Protective equipment and precautions for firefighters
Firefighters should wear self-contained breathing apparatus and full firefighting turnout gear.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal precautions
Use personal protective equipment as required.
For emergency responders
Use personal protective equipment as required.

Environmental precautions
Collect spillage to prevent release to the environment.

Methods and material for containment and cleaning up
Prevent further leakage or spillage if safe to do so.
Sweep or shovel material into dry containers. Avoid creating uncontrolled dust.

7. HANDLING AND STORAGE

Precautions for 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 minimize combustible dust hazard. Material, if exposed to water, may generate small amounts of hydrogen and ammonia gas over time. It is advised that ventilated drums and ventilated areas be used for storage. Drums and containers should be opened in ventilated areas that don't have sources of ignition.

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). Material, if exposed to water, may generate small amounts of hydrogen and ammonia gas over time. It is advised that ventilated drums and ventilated areas be used for storage.

Incompatible materials
Water. 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.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure Guidelines

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>ACGIH TLV</th>
<th>OSHA PEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Titanium 7440-32-6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Titanium Dioxide 13463-67-7</td>
<td>TWA: 10 mg/m³</td>
<td>TWA: 15 mg/m³ total dust</td>
</tr>
<tr>
<td>Aluminum 7429-90-5</td>
<td>TWA: 1 mg/m³ respirable fraction</td>
<td>TWA: 15 mg/m³ total dust TWA: 5 mg/m³ respirable fraction</td>
</tr>
<tr>
<td>Aluminum Oxide 1344-28-1</td>
<td>TWA: 1 mg/m³ respirable fraction</td>
<td>TWA: 15 mg/m³ total dust TWA: 5 mg/m³ respirable fraction</td>
</tr>
<tr>
<td>Titanium Nitride 25583-20-4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aluminum Nitride 24304-00-5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vanadium 7440-62-2</td>
<td></td>
<td>Ceiling: 0.5 mg/m³ V2O5 respirable dust Ceiling: 0.1 mg/m³ V2O5 fume</td>
</tr>
<tr>
<td>Iron 7439-89-6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Titanium Carbonitride 12654-86-3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Appropriate engineering controls
Engineering Controls
Avoid generation of uncontrolled particles.
Individual protection measures, such as 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**
Fire/flame resistant/retardant clothing may be appropriate during hot work with the product.

**Respiratory protection**
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 contaminant concentrations. Respiratory protection must be provided in accordance with current local regulations.

**General Hygiene Considerations**
Handle in accordance with good industrial hygiene and safety practice.

### 9. PHYSICAL AND CHEMICAL PROPERTIES

#### 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>Various blends of powders and chunks Odor Odorless</td>
<td></td>
</tr>
<tr>
<td><strong>Color</strong></td>
<td>Metallic gray, silver, or white Odor threshold Not applicable</td>
<td></td>
</tr>
<tr>
<td><strong>Melting point / freezing point</strong></td>
<td>-</td>
<td>Not applicable</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>Product not flammable in the form as distributed, flammable as finely divided particles or pieces resulting from processing of this product</td>
</tr>
</tbody>
</table>

#### Flammability Limit in Air
- **Upper flammability limit:** -
- **Lower flammability limit:** -

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

### 10. STABILITY AND REACTIVITY

**Reactivity**
Not applicable
Chemical stability
Stable under normal conditions.

Possibility of Hazardous Reactions
None under normal processing.

Hazardous polymerization
Hazardous polymerization does not occur.

Conditions to avoid
Dust formation and dust accumulation.

Incompatible materials
Water. 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.

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. Vanadium pentoxide (V2O5) affects eyes, skin, respiratory system. Product may release flammable or toxic vapors in contact with water.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Product Information

Inhalation
Product not classified.

Eye contact
Product not classified.

Skin Contact
Product not classified.

Ingestion
Product not classified.

<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 7440-32-6</td>
<td>&gt; 5000 mg/kg bw</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Titanium Dioxide 13463-67-7</td>
<td>&gt; 5000 mg/kg bw</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Aluminum 7429-90-5</td>
<td>15,900 mg/kg bw</td>
<td>-</td>
<td>&gt; 1 mg/L</td>
</tr>
<tr>
<td>Aluminum Oxide 1344-28-1</td>
<td>15,900 mg/kg bw</td>
<td>-</td>
<td>7.6 mg/L</td>
</tr>
<tr>
<td>Titanium Nitride 25583-20-4</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Aluminum Nitride 24304-00-5</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Vanadium 7440-62-2</td>
<td>&gt; 2000 mg/kg bw</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Iron 7439-89-6</td>
<td>98,600 mg/kg bw</td>
<td>-</td>
<td>&gt; 0.25 mg/L</td>
</tr>
<tr>
<td>Titanium Carbonitride 12654-86-3</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Information on toxicological effects

Symptoms
None known.

Acute toxicity
Product not classified.

Skin corrosion/irritation
Product not classified.
### 12. ECOLOGICAL INFORMATION

#### Ecotoxicity

This product as shipped is not classified for aquatic toxicity.

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Algae/aquatic plants</th>
<th>Fish</th>
<th>Toxicity to microorganisms</th>
<th>Crustacea</th>
</tr>
</thead>
</table>
| Titanium Dioxide   | The 72 h EC50 of titanium dioxide to Pseudokirchnerella subcapitata was 61 mg of TiO2/L. | The 96 h LC50 of titanium dioxide to Cyprinodon variegatus was greater than 10,000 mg of TiO2/L.  
The 96 h LC50 of titanium dioxide to Pimephales promelas was greater than 1,000 mg of TiO2/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 Daphnia Magna was greater than 1000 mg of TiO2/L. |                         |
| Aluminum Oxide     | The 96-h EC50 values for reduction of biomass of Pseudokirchnerella subcapitata in AAP-Medium at pH 6, 7, and 8 were estimated as 20.1, 5.4, and 150.6 μg/L, respectively, for dissolved Al. | The 96 h LC50 of aluminum to Oncorhynchus mykiss was 7.4 mg of Al/L at pH 6.5 and 14.6 mg of Al/L at pH 7.5.  
The 96-hr LC50 for Pimephales promelas exposed to Aluminum chloride ranged from 1.16 to 44.8 mg/L with water hardness increasing from 25 to 200 mg/L. | -                      | The 48-hr LC50 for Ceriodaphnia dubia exposed to Aluminium chloride increased from 0.72 to greater than 96.6 mg/L with water hardness increasing from 25 to 200 mg/L. |
| Vanadium           | The 72 h EC50 of vanadium pentoxide to Desmodesmus subspicatus was 2,907 μg of V/L. | The 96 h LC50 of vanadium pentoxide to Pimephales promelas was 1,850 μg of V/L.  
The 96-hr LC50 for Pimephales promelas exposed to Vanadium pentoxide ranged from 2.2 to 230 μg/L with pH ranging from 6.8 to 8.13. | -                      |                         |
| Iron               | The 96 h LC50 of 50% iron oxide black in water to Danio rerio was greater than 10,000 mg/L. | The 3 h EC50 of iron oxide for activated sludge was greater than 100 mg/L.  
The 48 h EC50 of iron oxide to Daphnia magna was greater than 100 mg/L. |                         |                         |
Other adverse effects

13. DISPOSAL CONSIDERATIONS

Waste treatment methods

Disposal of wastes
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.

This product contains one or more substances that are listed with the State of California as a hazardous waste.

14. TRANSPORT INFORMATION

Note:
Material, if exposed to water, may generate small amounts of hydrogen and ammonia gas over time. It is advised that ventilated drums and ventilated trailers be used for transport. Drums and containers should be opened in ventilated areas that don't have sources of ignition.

DOT
Not regulated

15. REGULATORY INFORMATION

International Inventories

<table>
<thead>
<tr>
<th>Inventory</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>TSCA</td>
<td>Complies</td>
</tr>
<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

US Federal Regulations

SARA 313
Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product contains a chemical or chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS No.</th>
<th>Weight-%</th>
<th>SARA 313 - Threshold Values %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum Oxide - 1344-28-1</td>
<td>1344-28-1</td>
<td>0 - 60</td>
<td>1.0</td>
</tr>
</tbody>
</table>

SARA 311/312 Hazard Categories
Acute health hazard  No
Chronic Health Hazard  No
Fire hazard  No
Sudden release of pressure hazard  No
Reactive Hazard  No

CWA (Clean Water Act)
This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

CERCLA
This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional, or state level pertaining to releases of this material

US State Regulations

California Proposition 65
This product contains the Proposition 65 chemicals listed below. Proposition 65 warning label available at ATImetals.com.

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>California Proposition 65</th>
</tr>
</thead>
<tbody>
<tr>
<td>Titanium Dioxide - 13463-67-7</td>
<td>Carcinogen</td>
</tr>
</tbody>
</table>

U.S. State Right-to-Know Regulations

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>New Jersey</th>
<th>Massachusetts</th>
<th>Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td>Titanium</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7440-32-6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Titanium Dioxide</td>
<td>13463-67-7</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Aluminum</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>7429-90-5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aluminum Oxide</td>
<td>1344-28-1</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Vanadium</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>7440-62-2</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

U.S. EPA Label Information
EPA Pesticide Registration Number  Not applicable

16. OTHER INFORMATION

NFPA  Health hazards: 0  Flammability: 0  Instability: 0  Physical and Chemical Properties:

HMIS  Health hazards: 1  Flammability: 1  Physical hazards: 0  Personal protection: X

Chronic Hazard Star Legend  * = Chronic Health Hazard

Issue Date  10-Jul-2015
Revision Date  13-Feb-2020
Revision Note  SDS sections updated: 2, 5, 6, 7, 8, 9, 10, 12, 14, 16

Note:
The information provided in this 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  Safety data sheets and labels available at ATImetals.com

from: