



# SAFETY DATA SHEET

Issue Date 28-May-2015

Revision Date 27-May-2016

Version (

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

### 1.1. Product identifier

**Product Code**  
*Product Name*

FRP008  
Stainless Steel

### Synonyms

Stainless Steel: ATI 20™, ATI 20-20+Nb™, ATI 201™, ATI 219™, 21-6-9, AL40, XM-11, ATI 301™, ATI 302™, ATI 303™, ATI 304™, ATI 305™, ATI 309™, ATI 310™, ATI 316™, ATI 317™, ATI 321™, ATI 255™ DUPLEX, ATI 332™, ATI 334™, ATI 347™, ATI 348™, AM 350®, AM 355™, ATI 403™, ATI Ohmaloy® 30, ATI Ohmaloy® 40, ATI Ohmaloy®, ATI 409 HP™, ATI 409 Cb™, ATI 410™, ATI 412™, Type 415, ATI 416™, ATI 420™, ATI 430™, ATI 433™, Type 434, Type 436, ATI 439™, ATI 439 HP™, XM-8, Type 441, 18-0, AL 18CrCb, ATI 441 HP™, ATI 444™, 18-2, ATI 468™, ATI 15-5™, ATI 17-4™, ATI 17-7™, ATI 15-7™, ATI JS700® ALLOY, ATI 800™ ALLOY, ATI 825™ ALLOY, Type 840, ATI E-BRITE® 26-1, ASTM XM 27, ATI 2205™ DUPLEX; 318, ATI 2205™ DUPLEX; 322, ATI 201LN™, Type 301L, ATI 304 DA™, Type 304H, ATI 304L™, 374L, Type 304LN, Type 304N, Type 309H, ATI 309S™, 398, Type 309Si, Type 310Cb, Type 310H, Type 310L, ATI 310S™, Type 310Si, ATI 316L™, 376, ATI 316LN™, ATI 316Ti™, ATI 317L™, ATI 317LMN™, 317 LX, 317 LXN, 317 XN, Type 321H, Type 410 MOD, Type 410HC, ATI 410S™, ATI 418 SPL™, Type 420HC, ALLEGHENY Type 425 Modified, ATI 436S™, ATI 440A™, ATI 440C™, ATI 800 AT™ ALLOY, ATI 800 H™ ALLOY, ATI 904L™, ATI 610™, ATI 611™, ATI 13-8Mo™, ATI 13-8 SuperTough®, AL 13-8 STAINLESS STEEL, ASTM Type XM-13, ATI 2003® DUPLEX, AL 20-25+Nb alloy, AL 29-4C®, AL 332Mo® alloy, AL 334Mo® alloy, ATI 201HP™, AL33, XM-29, ATI 4565™, ATI 50™, 22-13-5, XM-19, AL60, 21800, AL-6XN® ALLOY, AL-6XN Plus® ALLOY, A286 Altemp®, PC1017, Sea Cure ® 26-3-3, Zeron® 100, 22-4-9, 21-11N, HOLDER BLOCK STEEL, MAXEL 400 SUPER, AL-6X, AL 404, Type 405, Type 446, AL 29-4C®, AL 29-4, AL 29-4-2, 14-4 FERRITIC, AL 453, AL 466, ALTEMP ® ALLOY STEEL, 19-9-DL, Type 302B, ATI 409 Cb™, Type 409Ni, ATI 430Ti™, ALLEGHENY EDRO 441MOD1, ALLEGHENY CRUCIBLE 441MOD2, TOOL STEEL D2T, CSM-21 STAINLESS STEEL, ULTRACHEM STAINLESS STEEL, RA85H STEEL, 385, ZeCor™, RA 330™, ATI304B7 P/M™ BOR7

Contains Cobalt, Nickel

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

**Recommended Use** Stainless Steel product manufacture

**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

This product is an article and, as such, does not present a hazard to human health by inhalation or ingestion

### 2.1. Classification of the substance or mixture

*Regulation (EC) No 1272/2008*

Skin sensitisation	Category 1
Carcinogenicity	Category 2
Specific target organ toxicity (repeated exposure)	Category 1

## 2.2. Label elements

### Emergency Overview

#### Danger

#### Hazard statements

Suspected of causing cancer

May cause an allergic skin reaction

Causes damage to respiratory track prolonged or repeated exposure if inhaled.



**Appearance** Various massive product forms

**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

If skin irritation or rash occurs: Get medical advice/attention

#### 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, Hexavalent Chromium (Chromium VI) may cause lung, nasal, and/or sinus cancer, Vanadium pentoxide (V2O5) affects eyes, skin, respiratory system, Soluble molybdenum compounds such as molybdenum trioxide may cause lung irritation.

## Section 3: COMPOSITION/INFORMATION ON INGREDIENTS

### 3.1 Substances

#### Synonyms

Stainless Steel: ATI 20™, ATI 20-20+Nb™, ATI 201™, ATI 219™, 21-6-9, AL40, XM-11, ATI 301™, ATI 302™, ATI 303™, ATI 304™, ATI 305™, ATI 309™, ATI 310™, ATI 316™, ATI 317™, ATI 321™, ATI 255™ DUPLEX, ATI 332™, ATI 334™, ATI 347™, ATI 348™, AM 350®, AM 355™, ATI 403™, ATI Ohmaloy® 30, ATI Ohmaloy® 40, ATI Ohmaloy®, ATI 409 HP™, ATI 409 Cb™, ATI 410™, ATI 412™, Type 415, ATI 416™, ATI 420™, ATI 430™, ATI 433™, Type 434, Type 436, ATI 439™, ATI 439 HP™, XM-8, Type 441, 18-0, AL 18CrCb, ATI 441 HP™, ATI 444™, 18-2, ATI 468™, ATI 15-5™, ATI 17-4™, ATI 17-7™, ATI 15-7™, ATI JS700® ALLOY, ATI 800™ ALLOY, ATI 825™ ALLOY, Type 840, ATI E-BRITE® 26-1, ASTM XM 27, ATI 2205™ DUPLEX; 318, ATI 2205™ DUPLEX; 322, ATI 201LN™, Type 301L, ATI 304 DA™, Type 304H, ATI 304L™, 374L, Type 304LN, Type 304N, Type 309H, ATI 309S™, 398, Type 309Si, Type 310Cb, Type 310H, Type 310L, ATI

310S™, Type 310Si, ATI 316L™, 376, ATI 316LN™, ATI 316Ti™, ATI 317L™, ATI 317LMN™, 317 LX, 317 LXN, 317 XN, Type 321H, Type 410 MOD, Type 410HC, ATI 410S™, ATI 418 SPL™, Type 420HC, ALLEGHENY Type 425 Modified, ATI 436S™, ATI 440A™, ATI 440C™, ATI 800 AT™ ALLOY, ATI 800 H™ ALLOY, ATI 904L™, ATI 610™, ATI 611™, ATI 13-8Mo™, ATI 13-8 SuperTough®, AL 13-8 STAINLESS STEEL, ASTM Type XM-13, ATI 2003® DUPLEX, AL 20-25+Nb alloy, AL 29-4C®, AL 332Mo® alloy, AL 334Mo® alloy, ATI 201HP™, AL33, XM-29, ATI 4565™, ATI 50™, 22-13-5, XM-19, AL60, 21800, AL-6XN® ALLOY, AL-6XN Plus® ALLOY, A286 Altemp®, PC1017, Sea Cure® 26-3-3, Zeron® 100, 22-4-9, 21-11N, HOLDER BLOCK STEEL, MAXEL 400 SUPER, AL-6X, AL 404, Type 405, Type 446, AL 29-4C®, AL 29-4, AL 29-4-2, 14-4 FERRITIC, AL 453, AL 466, ALTEMP® ALLOY STEEL, 19-9-DL, Type 302B, ATI 409 Cb™, Type 409Ni, ATI 430Ti™, ALLEGHENY EDRO 441MOD1, ALLEGHENY CRUCIBLE 441MOD2, TOOL STEEL D2T, CSM-21 STAINLESS STEEL, ULTRACHEM STAINLESS STEEL, RA85H STEEL, 385, ZeCor™, RA 330™, ATI304B7 P/M™ BOR7.

Chemical Name	EC No	CAS No	Weight-%
Iron	231-096-4	7439-89-6	<90
Nickel	231-111-4	7440-02-0	0-46
Chromium	231-157-5	7440-47-3	10-30
Manganese	231-105-1	7439-96-5	0-10
Molybdenum	231-107-2	7439-98-7	0-7.0
Silicon	231-130-8	7440-21-3	0-6.5
Copper	231-159-6	7440-50-8	0-4.0
Aluminium	231-072-3	7429-90-5	0-4.0
Tungsten	231-143-9	7440-33-7	0-2.5
Titanium	231-142-3	7440-32-6	0-2.4
Boron	-	19287-88-8	0-2.25
Vanadium	231-171-1	7440-62-2	0-1.1
Tantalum	231-135-5	7440-25-7	0-1.0
Niobium	231-113-5	7440-03-1	0-1.0

## Section 4: FIRST AID MEASURES

### 4.1. Description of first aid measures

<b>Inhalation</b>	If excessive amounts of vapors, smoke, fume, or particles are inhaled during processing, remove to fresh air and consult a qualified health professional.
<b>Skin Contact</b>	In the case of skin irritation or allergic reactions see a doctor.
<b>Eye contact</b>	In the case of particles coming in contact with eyes during processing, treat as with any foreign object.
<b>Ingestion</b>	Not an expected route of exposure.

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

<b>Symptoms</b>	May cause allergic skin reaction.
-----------------	-----------------------------------

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

<b>Note to doctors</b>	Treat symptomatically.
------------------------	------------------------

## Section 5: FIRE FIGHTING MEASURES

### 5.1. Extinguishing media

#### Suitable extinguishing media

None in massive form, flammable as finely divided particles. Smother 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. Hexavalent Chromium (Chromium VI) may cause lung, nasal, and/or sinus cancer. Vanadium pentoxide (V<sub>2</sub>O<sub>5</sub>) affects eyes, skin, respiratory system. zinc, copper, magnesium, or cadmium fumes may cause metal fume fever. Soluble molybdenum compounds such as molybdenum trioxide may cause lung irritation.

**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.

**6.2. Environmental precautions**

Not applicable to massive product.

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

**Methods for containment** Not applicable to massive product.

**Methods for cleaning up** Not applicable to massive product.

**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 chips, turnings, dust, and other small particles 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
Iron 7439-89-6	-	-	-	-	-
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
Chromium 7440-47-3	TWA: 2 mg/m <sup>3</sup>	STEL: 1.5 mg/m <sup>3</sup> TWA: 0.5 mg/m <sup>3</sup>	TWA: 2 mg/m <sup>3</sup>	TWA: 2 mg/m <sup>3</sup>	TWA: 2 mg/m <sup>3</sup>
Manganese 7439-96-5	-	STEL: 1.5 mg/m <sup>3</sup> TWA: 0.5 mg/m <sup>3</sup>	TWA: 1 mg/m <sup>3</sup>	TWA: 0.2 mg/m <sup>3</sup>	TWA: 0.2 mg/m <sup>3</sup> TWA: 0.02 mg/m <sup>3</sup> Ceiling / Peak: 1.6 mg/m <sup>3</sup> Ceiling / Peak: 0.16 mg/m <sup>3</sup> TWA: 0.5 mg/m <sup>3</sup>
Molybdenum 7439-98-7	-	-	-	TWA: 10 mg/m <sup>3</sup> TWA: 3 mg/m <sup>3</sup>	-
Silicon 7440-21-3	-	STEL: 30 ppm STEL: 12 mg/m <sup>3</sup> TWA: 10 mg/m <sup>3</sup> TWA: 4 mg/m <sup>3</sup>	TWA: 10 mg/m <sup>3</sup>	-	-
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>
Aluminium 7429-90-5	-	STEL: 30 mg/m <sup>3</sup> STEL: 12 mg/m <sup>3</sup> TWA: 10 mg/m <sup>3</sup> TWA: 4 mg/m <sup>3</sup>	TWA: 10 mg/m <sup>3</sup> TWA: 5 mg/m <sup>3</sup>	TWA: 10 mg/m <sup>3</sup> TWA: 5 mg/m <sup>3</sup>	TWA: 4 mg/m <sup>3</sup> TWA: 1.5 mg/m <sup>3</sup>
Tungsten 7440-33-7	-	STEL: 10 mg/m <sup>3</sup> TWA: 5 mg/m <sup>3</sup>	-	STEL: 10 mg/m <sup>3</sup> TWA: 5 mg/m <sup>3</sup>	-
Titanium 7440-32-6	-	-	-	-	-
Boron 19287-88-8	-	-	-	-	-
Vanadium 7440-62-2	-	-	-	-	Skin
Tantalum 7440-25-7	-	STEL: 10 mg/m <sup>3</sup> TWA: 5 mg/m <sup>3</sup>	TWA: 5 mg/m <sup>3</sup>	TWA: 5 mg/m <sup>3</sup>	TWA: 4 mg/m <sup>3</sup> TWA: 1.5 mg/m <sup>3</sup>
Niobium 7440-03-1	-	-	-	-	-
Chemical Name	Italy	Portugal	Netherlands	Finland	Denmark
Iron 7439-89-6	-	-	-	-	-
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>
Chromium 7440-47-3	TWA: 0.5 mg/m <sup>3</sup>	TWA: 0.5 mg/m <sup>3</sup>	TWA: 0.5 mg/m <sup>3</sup>	TWA: 0.5 mg/m <sup>3</sup>	TWA: 0.5 mg/m <sup>3</sup>
Manganese 7439-96-5	-	TWA: 0.2 mg/m <sup>3</sup>	-	TWA: 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>
Molybdenum 7439-98-7	-	TWA: 10 mg/m <sup>3</sup> TWA: 3 mg/m <sup>3</sup>	-	TWA: 0.5 mg/m <sup>3</sup>	-

Silicon 7440-21-3	-	-	-	-	TWA: 10 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>
Aluminium 7429-90-5	-	TWA: 10 mg/m <sup>3</sup> TWA: 5 mg/m <sup>3</sup>	TWA: 0.05 mg/m <sup>3</sup>	TWA: 1.5 mg/m <sup>3</sup>	TWA: 5 mg/m <sup>3</sup> TWA: 2 mg/m <sup>3</sup>
Tungsten 7440-33-7	-	STEL: 10 mg/m <sup>3</sup> TWA: 5 mg/m <sup>3</sup>	-	TWA: 5 mg/m <sup>3</sup>	TWA: 5 mg/m <sup>3</sup>
Titanium 7440-32-6	-	-	-	-	-
Boron 19287-88-8	-	-	-	-	-
Vanadium 7440-62-2	-	-	-	-	-
Tantalum 7440-25-7	-	TWA: 5 mg/m <sup>3</sup>	-	TWA: 5 mg/m <sup>3</sup>	TWA: 5 mg/m <sup>3</sup>
Niobium 7440-03-1	-	-	-	-	TWA: 5 mg/m <sup>3</sup> TWA: 0.5 mg/m <sup>3</sup>
<b>Chemical Name</b>	<b>Austria</b>	<b>Switzerland</b>	<b>Poland</b>	<b>Norway</b>	<b>Ireland</b>
Iron 7439-89-6	-	-	-	-	-
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>
Chromium 7440-47-3	TWA: 2 mg/m <sup>3</sup>	TWA: 0.5 mg/m <sup>3</sup>	TWA: 0.5 mg/m <sup>3</sup>	TWA: 0.5 mg/m <sup>3</sup> STEL: 1.5 mg/m <sup>3</sup>	TWA: 2 mg/m <sup>3</sup>
Manganese 7439-96-5	STEL 2 mg/m <sup>3</sup> TWA: 0.5 mg/m <sup>3</sup>	TWA: 0.5 mg/m <sup>3</sup>	TWA: 0.3 mg/m <sup>3</sup>	TWA: 1 mg/m <sup>3</sup> TWA: 0.1 mg/m <sup>3</sup> STEL: 3 ppm STEL: 0.3 mg/m <sup>3</sup>	TWA: 0.2 mg/m <sup>3</sup> STEL: 3 mg/m <sup>3</sup>
Molybdenum 7439-98-7	STEL 20 mg/m <sup>3</sup> TWA: 10 mg/m <sup>3</sup>	TWA: 10 mg/m <sup>3</sup>	STEL: 10 mg/m <sup>3</sup> TWA: 4 mg/m <sup>3</sup>	-	TWA: 0.5 mg/m <sup>3</sup>
Silicon 7440-21-3	-	TWA: 3 mg/m <sup>3</sup>	-	TWA: 10 mg/m <sup>3</sup> STEL: 20 mg/m <sup>3</sup>	TWA: 10 mg/m <sup>3</sup> TWA: 4 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>
Aluminium 7429-90-5	STEL 20 mg/m <sup>3</sup> TWA: 10 mg/m <sup>3</sup>	TWA: 3 mg/m <sup>3</sup>	TWA: 2.5 mg/m <sup>3</sup> TWA: 1.2 mg/m <sup>3</sup>	TWA: 5 mg/m <sup>3</sup> STEL: 10 mg/m <sup>3</sup>	TWA: 1 mg/m <sup>3</sup> TWA: 5 mg/m <sup>3</sup>
Tungsten 7440-33-7	STEL 10 mg/m <sup>3</sup> TWA: 5 mg/m <sup>3</sup>	TWA: 5 mg/m <sup>3</sup>	TWA: 5 mg/m <sup>3</sup>	TWA: 5 mg/m <sup>3</sup> STEL: 10 mg/m <sup>3</sup>	TWA: 5 mg/m <sup>3</sup> STEL: 10 mg/m <sup>3</sup>
Titanium 7440-32-6	-	-	STEL: 30 mg/m <sup>3</sup> TWA: 10 mg/m <sup>3</sup>	-	-
Boron 19287-88-8	-	-	-	-	-
Vanadium 7440-62-2	STEL 1 mg/m <sup>3</sup> TWA: 0.5 mg/m <sup>3</sup>	-	-	TWA: 0.2 mg/m <sup>3</sup> Ceiling: 0.05 mg/m <sup>3</sup> STEL: 0.6 mg/m <sup>3</sup>	-
Tantalum 7440-25-7	TWA: 5 mg/m <sup>3</sup>	TWA: 5 mg/m <sup>3</sup>	TWA: 5 mg/m <sup>3</sup>	-	TWA: 5 mg/m <sup>3</sup> STEL: 10 mg/m <sup>3</sup>
Niobium 7440-03-1	STEL 10 mg/m <sup>3</sup> STEL 1 mg/m <sup>3</sup> TWA: 5 mg/m <sup>3</sup> TWA: 0.5 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 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

<b>Skin and body protection</b>	shield the eyes from particles. Wear fire/flammable resistant/retardant clothing. Cut-resistant gloves and/or protective clothing may be appropriate when sharp surfaces are present.
<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>	Various massive product forms	<b>Odour threshold</b>	Not applicable
<b>Colour</b>	metallic, grey		
<b>Property</b>	<b>Values</b>	<b>Remarks • Method</b>	
<b>pH</b>	-		
<b>Melting point/freezing point</b>	1430-1540 °C / 2600-2800 °F		
<b>Boiling point / boiling range</b>	-		
<b>Flash point</b>	-		
<b>Evaporation rate</b>	-	Not applicable	
<b>Flammability (solid, gas)</b>	-	None in massive form, flammable as finely divided particles	
<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>	7-9		
<b>Water solubility</b>	Insoluble	Insoluble	
<b>Solubility(ies)</b>		Not applicable	
<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. Hexavalent Chromium (Chromium VI) may cause lung, nasal, and/or sinus cancer. Vanadium pentoxide (V<sub>2</sub>O<sub>5</sub>) affects eyes, skin, respiratory system. Soluble molybdenum compounds such as molybdenum trioxide may cause lung irritation.

**Section 11: TOXICOLOGICAL INFORMATION****11.1. Information on toxicological effects****Product Information**

<b>Inhalation</b>	Not an expected route of exposure for product in massive form.
<b>Eye contact</b>	Not an expected route of exposure for product in massive form.
<b>Skin Contact</b>	May cause sensitisation by skin contact.
<b>Ingestion</b>	Not an expected route of exposure for product in massive form.
<b>Unknown Acute Toxicity</b>	

Chemical Name	Oral LD50	Dermal LD50	Inhalation LC50
Iron	98,600 mg/kg bw	-	> 0.25 mg/L
Nickel	> 9000 mg/kg bw	-	> 10.2 mg/L
Chromium	> 3400 mg/kg bw	-	> 5.41 mg/L
Manganese	>2000 mg/kg bw	-	>5.14 mg/L
Molybdenum	> 2000 mg/kg bw	> 2000 mg/kg bw	> 5.10 mg/L
Silicon	> 5000 mg/kg bw	> 5000 mg/kg bw	> 2.08 mg/L
Copper	481 mg/kg bw	>2000 mg/kg bw	>5.11 mg/L
Aluminium	15,900 mg/kg bw	-	> 1 mg/L
Tungsten	> 2000 mg/kg bw	> 2000 mg/kg bw	> 5.4 mg/L
Titanium	> 5000 mg/kg bw	-	-
Boron	> 2000 mg/kg bw	-	-
Vanadium	> 2000 mg/kg bw	-	-
Tantalum	> 2000 mg/kg bw	> 2000 mg/kg bw	> 5.18 mg/L
Niobium	> 10,000 mg/kg bw	> 2000 mg/kg bw	-

**Information on toxicological effects**

**Symptoms** May cause sensitisation by skin contact.

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

**Acute toxicity** Product not classified.

**Skin corrosion/irritation** 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.
<b>Carcinogenicity</b>	May cause cancer by inhalation.

Chemical Name	ACGIH	IARC	NTP	OSHA
Nickel 7440-02-0		Group 1 Group 2B	Known Reasonably Anticipated	X
Chromium 7440-47-3		Group 3		

<b>Reproductive toxicity</b>	Product not classified.
<b>STOT - single exposure</b>	Product not classified.
<b>STOT - repeated exposure</b>	Causes disorder and damage to the: Respiratory System.
<b>Aspiration hazard</b>	Product not classified.

## Section 12: ECOLOGICAL INFORMATION

### 12.1. Toxicity

This product as shipped is not classified for aquatic toxicity This product contains a chemical which is listed as a severe marine pollutant according to IMDG/IMO

Chemical Name	Algae/aquatic plants	Fish	Toxicity to Micro-organisms	Crustacea
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 10,000 mg/L.	The 48 h EC50 of iron oxide to Daphnia magna was greater than 100 mg/L.
Nickel	NOEC/EC10 values range from 12.3 µg/l for Scenedesmus accuminatus to 425 µg/l for Pseudokirchneriella subcapitata.	The 96h LC50s values range from 0.4 mg Ni/L for Pimephales promelas to 320 mg Ni/L for Brachydanio rerio.	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 Ceriodaphnia dubia to 4970 mg Ni/L for Daphnia magna.
Chromium	-	-	-	-
Manganese	The 72 h EC50 of manganese to Desmodesmus subspicatus was 2.8 mg of Mn/L.	The 96 h LC50 of manganese to Oncorhynchus mykiss was greater than 3.6 mg of Mn/L.	The 3 h EC50 of manganese for activated sludge was greater than 1000 mg/L.	The 48 h EC50 of manganese to Daphnia magna was greater than 1.6 mg/L.
Molybdenum	The 72 h EC50 of sodium molybdate dihydrate to Pseudokirchneriella subcapitata was 362.9 mg of Mo/L.	The 96 h LC50 of sodium molybdate dihydrate to Pimephales promelas was 644.2 mg/L.	The 3 h EC50 of molybdenum trioxide for activated sludge was 820 mg/L.	The 48 h LC50 of sodium molybdate dihydrate to Ceriodaphnia dubia was 1,015 mg/L. The 48 h LC50 of sodium molybdate dihydrate to Daphnia magna was greater than 1,727.8 mg/L.
Silicon	The 72 h EC50 of sodium metasilicate pentahydrate to Pseudokirchneriella subcapitata was greater than 250 mg/L.	-	-	-
Copper	The 72 h EC50 values of copper chloride to Pseudokirchneriella subcapitata ranged	The 96-hr LC50 for Pimephales promelas exposed to Copper sulfate ranged from 256.2 to 38.4	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 Daphnia magna exposed to copper in natural water ranged between 33.8 µg/L

	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).	ug/L with water hardness increasing from 45 to 255.7 mg/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).
Aluminium	The 96-h EC50 values for reduction of biomass of <i>Pseudokirchneriella subcapitata</i> 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 <i>Oncorhynchus mykiss</i> was 7.4 mg of Al/L at pH 6.5 and 14.6 mg of Al/L at pH 7.5	-	The 48-hr LC50 for <i>Ceriodaphnia dubia</i> exposed to Aluminium chloride increased from 0.72 to greater than 99.6 mg/L with water hardness increasing from 25 to 200 mg/L.
Tungsten	The 72 h EC50 of sodium tungstate to <i>Pseudokirchnerella subcapitata</i> was 31.0 mg of W/L.	The 96 h LC50 of sodium tungstate to <i>Danio rerio</i> was greater than 106 mg of W/L.	The 30 min EC50 of sodium tungstate for activated sludge were greater than 1000 mg/L.	The 48 h EC50 of sodium tungstate to <i>Daphnia magna</i> was greater than 96 mg of W/L.
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.
Boron	The 72-h EC50 value for reduction of biomass of <i>Pseudokirchneriella subcapitata</i> exposed to Boric acid at pH 7.5 to 8.3 was 40.2 mg/L	The 96-hr LC50 for <i>Pimephales promelas</i> exposed to Boric acid (82%)/borax (18%) mixture was 79.7 mg/L with water hardness of 91 mg/L and water pH of 8.0.	The 3 h NOEC of boric acid for activated sludge ranged from 17.5 to 20 mg/L.	The 48-hr LC50 for <i>Ceriodaphnia dubia</i> exposed to Boric acid/borax mixture ranged from 91 to 165 mg/L with pH ranging from 6.7 to 8.4.
Vanadium	The 72 h EC50 of vanadium pentoxide to <i>Desmodesmus subspicatus</i> was 2,907 µg of V/L.	The 96 h LC50 of vanadium pentoxide to <i>Pimephales promelas</i> was 1,850 µg of V/L.	The 3 h EC50 of sodium metavanadate for activated sludge was greater than 100 mg/L.	The 48 h EC50 of sodium vanadate to <i>Daphnia magna</i> was 2,661 µg of V/L.
Tantalum	-	-	-	-
Niobium	-	-	-	-

## 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

This product as shipped is not classified for environmental endpoints. However, when subjected to sawing or grinding, particles may be generated that are classified for aquatic acute or aquatic chronic toxicity

# 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** None anticipated.

## Section 14: TRANSPORT INFORMATION

### IMDG

14.1 UN/ID no Not regulated  
 14.2 Proper shipping name Not regulated  
 14.3 Hazard Class Not regulated  
 14.4 Packing Group Not regulated  
 14.5 Marine pollutant Not applicable  
 14.6 Special Provisions None  
 14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code Not applicable

### RID

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

### ADR

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

### ICAO (air)

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

### IATA

14.1 UN/ID no Not regulated  
 14.2 Proper shipping name Not regulated  
 14.3 Hazard Class Not regulated  
 14.4 Packing Group Not regulated  
 Description Not applicable  
 14.5 Environmental hazard Not applicable  
 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
Iron 7439-89-6	RG 44, RG 44bis, RG 94	-
Nickel 7440-02-0	RG 37ter	-

Chromium 7440-47-3	RG 10	-
Manganese 7439-96-5	-	-
Molybdenum 7439-98-7	-	-
Silicon 7440-21-3	-	-
Copper 7440-50-8	-	-
Aluminium 7429-90-5	RG 32 RG 16, RG 16bis	-
Tungsten 7440-33-7	-	-
Titanium 7440-32-6	-	-
Boron 19287-88-8	-	-
Vanadium 7440-62-2	RG 66	-
Tantalum 7440-25-7	-	-
Niobium 7440-03-1	-	-

### 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

TSCA	Complies
DSL/NDSL	Complies
EINECS/ELINCS	Complies
ENCS	Complies
IECSC	Complies
KECL	Complies
PICCS	Complies
AICS	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 28-May-2015

Revision Date 27-May-2016

**Revision Note**

Updated Section(s): 1, 3, 7.

**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)