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Version 5

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

### 1.1. Product identifier

**Product Code** SM004  
*Product Name* Iron-Base Alloys

**Synonyms** Non-powder forms of AL-6XN® Alloy, AM 355® Alloy, ATI 1014™ Alloy, ATI 13-8Mo SuperTough® Alloy, ATI 13-8Mo™ Alloy, ATI 15-5™ Alloy, ATI 26-1™ Alloy, ATI 300M™ Alloy, ATI 301™ Alloy, ATI 304™ Alloy, ATI 316L™ Alloy, ATI 403™ Alloy, ATI 4340M™ Alloy, ATI 4340™ Alloy, ATI 450™ Alloy, ATI 455™ Alloy, ATI 53™ Alloy, ATI 611™ Alloy, ATI 802™ Alloy, ATI 9310™ Alloy, ATI 9-4-30™ Alloy, ATI Aero100™ Alloy, ATI Datalloy 2® Alloy, ATI Datalloy HP™ Alloy, ATI HCM3™ Alloy, ATI M250™ Alloy, ATI REX 734™ Alloy, ATI S240® Alloy, ATI VascoMax® C-200 Alloy, ATI VascoMax® C-250 Alloy, ATI VascoMax® C-300 Alloy, ATI VascoMax® C-350 Alloy, ATI VascoMax® T-200 Alloy, ATI VascoMax® T-250 Alloy, ATI X-2M™ Alloy, ATI XM-19™ Alloy, Ethalloy II®\* Alloy (\* a Registered Trademark of Ethicon, Inc.), VASCO® M-1™ Alloy, R35, R35S, R39, 18-4-1, RBD, ATI FV448B™, FV448™, S62, FV458, 1%CrMoV, Nitralloy, F1E, A286L, 15/15PH, SiMnCuMoV, ATI 321H™, ATI CRV2™, ATI FV535™, ATI FV607™, ATI HCM5™, and ATI Jethete™ M152

Contains Cobalt, Nickel

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

**Recommended Use** Iron 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 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*

Acute toxicity - Oral	Category 4
Respiratory sensitisation	Category 1B
Skin sensitisation	Category 1
Carcinogenicity	Category 1B
Reproductive toxicity	Category 2
Specific target organ toxicity — repeated exposure	Category 1

### 2.2. Label elements

Emergency Overview

**Danger****Hazard statements**

Harmful if swallowed  
 May cause allergy or asthma symptoms or breathing difficulties if inhaled  
 May cause an allergic skin reaction  
 May cause cancer  
 Suspected of damaging fertility or the unborn child  
 Causes damage to the respiratory tract through 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  
 If experiencing respiratory symptoms: Call a POISON CENTER or doctor/physician  
 IF SWALLOWED: Call a POISON CENTER or doctor/physician 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:: Hexavalent Chromium (Chromium VI) may cause lung, nasal, and/or sinus cancer; Zinc, copper, magnesium, or cadmium fumes may cause metal fume fever; Soluble molybdenum compounds such as molybdenum trioxide may cause lung irritation.

## Section 3: COMPOSITION/INFORMATION ON INGREDIENTS

**3.1 Substances****Synonyms**

Non-powder forms of AL-6XN® Alloy, AM 355® Alloy, ATI 1014™ Alloy, ATI 13-8Mo SuperTough® Alloy, ATI 13-8Mo™ Alloy, ATI 15-5™ Alloy, ATI 26-1™ Alloy, ATI 300M™ Alloy, ATI 301™ Alloy, ATI 304™ Alloy, ATI 316L™ Alloy, ATI 403™ Alloy, ATI 4340M™ Alloy, ATI 4340™ Alloy, ATI 450™ Alloy, ATI 455™ Alloy, ATI 53™ Alloy, ATI 611™ Alloy, ATI 802™ Alloy, ATI 9310™ Alloy, ATI 9-4-30™ Alloy, ATI Aero100™ Alloy, ATI Datalloy 2® Alloy, ATI Datalloy HP™ Alloy, ATI HCM3™ Alloy, ATI M250™ Alloy, ATI REX 734™ Alloy, ATI S240® Alloy, ATI VascoMax® C-200 Alloy, ATI VascoMax® C-250 Alloy, ATI VascoMax® C-300 Alloy, ATI VascoMax® C-350 Alloy, ATI VascoMax® T-200 Alloy, ATI VascoMax® T-250 Alloy, ATI X-2M™ Alloy, ATI XM-19™ Alloy, Ethalloy II®\* Alloy (\* a Registered Trademark of Ethicon, Inc.), VASCO® M-1™ Alloy, R35, R35S, R39, 18-4-1, RBD, ATI FV448B™, FV448™, S62, FV458, 1%CrMoV, Nitralloy, F1E, A286L, 15/15PH, SiMnCuMoV, ATI 321H™, ATI CRV2™, ATI FV535™, ATI FV607™, ATI HCM5™, and ATI Jethete™ M152.

Chemical Name	EC No	CAS No	Weight-%
Iron	231-096-4	7439-89-6	35 - 95
Nickel	231-111-4	7440-02-0	0 - 35
Chromium	231-157-5	7440-47-3	0 - 30
Manganese	231-105-1	7439-96-5	0 - 16
Cobalt	213-158-0	7440-48-4	0 - 15
Silicon	231-130-8	7440-21-3	0 - 7
Molybdenum	231-107-2	7439-98-7	0 - 5
Copper	231-159-6	7440-50-8	0 - 5
Tungsten	231-143-9	7440-33-7	0 - 3

## Section 4: FIRST AID MEASURES

### 4.1. Description of first aid measures

<b>Inhalation</b>	If excessive amounts of smoke, fume, or particulate 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. May cause acute gastrointestinal effects if swallowed. May cause allergy or asthma symptoms or breathing difficulties if inhaled.
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### 4.3. Indication of any immediate medical attention and special treatment needed

<b>Note to doctors</b>	Treat symptomatically.
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## 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) 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. 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** Hexavalent Chromium (Chromium VI) may cause lung, nasal, and/or sinus cancer; 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

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.

### 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**

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.

### 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>
Cobalt 7440-48-4	-	STEL: 0.3 mg/m <sup>3</sup> TWA: 0.1 mg/m <sup>3</sup>	-	TWA: 0.02 mg/m <sup>3</sup>	Skin
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>	-	-
Molybdenum 7439-98-7	-	-	-	TWA: 10 mg/m <sup>3</sup> TWA: 3 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>
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>	-
<b>Chemical Name</b>	<b>Italy</b>	<b>Portugal</b>	<b>Netherlands</b>	<b>Finland</b>	<b>Denmark</b>
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>
Cobalt 7440-48-4	-	TWA: 0.02 mg/m <sup>3</sup>	TWA: 0.02 mg/m <sup>3</sup>	TWA: 0.02 mg/m <sup>3</sup>	TWA: 0.01 mg/m <sup>3</sup>
Silicon 7440-21-3	-	-	-	-	TWA: 10 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>	-
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>
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>
<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>
Cobalt 7440-48-4	Skin	Skin TWA: 0.05 mg/m <sup>3</sup>	STEL: 0.2 mg/m <sup>3</sup> TWA: 0.02 mg/m <sup>3</sup>	TWA: 0.02 mg/m <sup>3</sup> STEL: 0.06 mg/m <sup>3</sup>	TWA: 0.1 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>
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>
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>
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>

**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**

<b>Engineering Controls</b>	Avoid generation of uncontrolled particles.
<b>Personal protective equipment</b>	
<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. 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.
<b>Environmental exposure controls</b>	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 or Silver		
<b>Property</b>	<b>Values</b>	<b>Remarks • Method</b>	
<b>pH</b>	-		
<b>Melting point/freezing point</b>	1420 - 1450 °C 2590 - 2650 °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>	7-9		
<b>Water solubility</b>	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.

### 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: Hexavalent Chromium (Chromium VI) may cause lung, nasal, and/or sinus cancer, 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>	Nickel or Cobalt containing alloys may cause sensitisation by skin contact.
<b>Ingestion</b>	Not an expected route of exposure for product in massive form.

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
Cobalt	550 mg/kg bw	>2000 mg/kg bw	<0.05 mg/L
Silicon	> 5000 mg/kg bw	> 5000 mg/kg bw	> 2.08 mg/L
Molybdenum	> 2000 mg/kg bw	> 2000 mg/kg bw	> 5.10 mg/L
Copper	481 mg/kg bw	>2000 mg/kg bw	>5.11 mg/L
Tungsten	> 2000 mg/kg bw	> 2000 mg/kg bw	> 5.4 mg/L

### Information on toxicological effects

**Symptoms** Nickel or Cobalt containing alloys may cause sensitisation by skin contact. May cause allergy or asthma symptoms or breathing difficulties if inhaled. May cause acute gastrointestinal effects if swallowed.

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

<b>Acute toxicity</b>	Harmful if swallowed. Cobalt-containing powders may be fatal if inhaled.
<b>Skin corrosion/irritation</b>	Product not classified.
<b>Serious eye damage/eye irritation</b>	Product not classified.
<b>Sensitisation</b>	Nickel or Cobalt containing alloys may cause sensitisation by skin contact. Cobalt-containing alloys may cause sensitization by inhalation.
<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		
Cobalt 7440-48-4	A3	Group 2A Group 2B	Known	X

<b>Reproductive toxicity</b>	Possible risk of impaired fertility.
<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

Chemical Name	Algae/aquatic plants	Fish	Toxicity to microorganisms	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 <i>Scenedesmus accuminatus</i> to 425 µg/l for <i>Pseudokirchneriella 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> .
Chromium	-	-	-	-
Manganese	The 72 h EC50 of manganese to <i>Desmodesmus subspicatus</i> was 2.8 mg of Mn/L.	The 96 h LC50 of manganese to <i>Oncorhynchus mykiss</i> 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 <i>Daphnia magna</i> was greater than 1.6 mg/L.
Cobalt	The 72 h EC50 of cobalt dichloride to <i>Pseudokirchneriella subcapitata</i> was 144 µg of Co/L.	The 96h LC50 of cobalt dichloride ranged from 1.5 mg Co/L for <i>Oncorhynchus mykiss</i> to 85 mg Co/L for <i>Danio rerio</i> .	The 3 h EC50 of cobalt dichloride for activated sludge was 120 mg of Co/L.	The 48 h LC50 of cobalt dichloride ranged from 0.61 mg Co/L for <i>Ceriodaphnia dubia</i> tested in soft, DOM-free water to >1800mg Co/L for <i>Tubifex tubifex</i> in very hard water.
Silicon	The 72 h EC50 of sodium metasilicate pentahydrate to <i>Pseudokirchnerella subcapitata</i> was greater than 250 mg/L.	-	-	-



Molybdenum	The 72 h EC50 of sodium molybdate dihydrate to <i>Pseudokirchneriella subcapitata</i> was 362.9 mg of Mo/L.	The 96 h LC50 of sodium molybdate dihydrate to <i>Pimephales promelas</i> 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 <i>Ceriodaphnia dubia</i> was 1,015 mg/L. The 48 h LC50 of sodium molybdate dihydrate to <i>Daphnia magna</i> was greater than 1,727.8 mg/L.
Copper	The 72 h EC50 values of copper chloride to <i>Pseudokirchneriella 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).
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.

**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**

<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>	None anticipated.

## Section 14: TRANSPORT INFORMATION

**IMDG**

<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 Marine pollutant</b>	Not applicable
<b>14.6 Special Provisions</b>	None
<b>14.7 Transport in bulk according to Annex II of MARPOL and the IBC</b>	Not applicable

**Code****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

<b>Section 15: REGULATORY INFORMATION</b>
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**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	-	-
Cobalt 7440-48-4	RG 65, RG 70, RG 70bis, RG 70ter	-
Silicon 7440-21-3	-	-
Molybdenum 7439-98-7	-	-
Copper 7440-50-8	-	-
Tungsten 7440-33-7	-	-

**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**

<b>Issue Date</b>	28-May-2015
<b>Revision Date</b>	10-Sep-2018
<b>Revision Note</b>	Updated Section(s): 4, 5, 7, 9, 11, 12, 15.

**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