



SAFETY DATA SHEET

Issue Date 28-May-2015

Revision Date 12-Jan-2016

Version (

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

Product identifier

Product Name Iron/Cobalt Alloy Respirable Powder

Other means of identification

Product Code PM011

UN/ID No. 3288

Synonyms C200, C250, C300, C350, T200, T250, T300 and HWM

Recommended use of the chemical and restrictions on use

Recommended Use Iron 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

Emergency Telephone Chemtrec: 1-800-424-9300

2. HAZARDS IDENTIFICATION

Classification

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Acute toxicity - Oral	Category 4
Acute toxicity - Inhalation (Dusts/Mists)	Category 2
Respiratory sensitization	Category 1B
Skin sensitization	Category 1
Carcinogenicity	Category 1B
Reproductive toxicity	Category 2
Specific target organ toxicity (repeated exposure)	Category 1
Acute aquatic toxicity	Category 1
Chronic aquatic toxicity	Category 1

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

Very toxic to aquatic life

Very toxic to aquatic life with long lasting effects

Fatal if inhaled

**Appearance** Powder**Physical state** Solid**Odor** Odorless**Precautionary Statements - Prevention**

Do not handle until all safety precautions have been read and understood
 Use personal protective equipment as required
 Wear protective gloves
 Wash hands thoroughly after handling
 Do not eat, drink or smoke when using this product
 Avoid breathing dust/fume/gas/mist/vapors/spray
 Avoid release to the environment
 Wear respiratory protection
 Contaminated work clothing should not be allowed out of the workplace
 IF ON SKIN: Wash with plenty of soap and water

Precautionary Statements - Response

Collect spillage
 If Inhaled: Immediately call a POISON CENTER or doctor/ physician
 If skin irritation or rash occurs: Get medical advice/attention
 Wash contaminated clothing before reuse
 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 - Storage

Store in a well-ventilated place. Keep container tightly closed

Precautionary Statements - Disposal

Dispose of contents/container to an approved waste disposal plant

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, Vanadium pentoxide (V₂O₅) affects eyes, skin, respiratory system
 Soluble molybdenum compounds such as molybdenum trioxide may cause lung irritation

3. COMPOSITION/INFORMATION ON INGREDIENTS

Synonyms

C200, C250, C300, C350, T200, T250, T300 and HWM.

Chemical Name	CAS No.	Weight-%
Iron	7439-89-6	50-80
Cobalt	7440-48-4	0-50
Nickel	7440-02-0	0-42
Chromium	7440-47-3	0-40
Vanadium	7440-62-2	0-15
Molybdenum	7439-98-7	0-11
Tungsten	7440-33-7	0-8

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	In the case of skin irritation or allergic reactions see a physician. Wash off immediately with soap and plenty of water.
Inhalation	If excessive amounts of vapors, smoke, fume, or particles are inhaled during processing, remove to fresh air and consult a qualified health professional. In the case of asthma symptoms or breathing difficulties call a physician:
Ingestion	IF SWALLOWED. Call a POISON CENTER or doctor/physician if you feel unwell.

Most important symptoms and effects, both acute and delayed

Symptoms	May cause allergic skin reaction. May cause allergy or asthma symptoms or breathing difficulties if inhaled. May cause acute gastrointestinal effects if swallowed.
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Indication of any immediate medical attention and special treatment needed

Note to physicians	Treat symptomatically.
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5. FIRE-FIGHTING MEASURES

Suitable extinguishing media

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.

Specific hazards arising from the chemical

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 minimize combustible dust hazard.

Hazardous combustion products 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.

Explosion data

Sensitivity to Mechanical Impact None.

Sensitivity to Static Discharge None.

Protective equipment and precautions for firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH approved (or equivalent) respirator and full protective 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. Follow Emergency Response Guidebook, Guide No. 152, EXCEPT for FIRE follow Emergency Response Guidebook, Guide No. 170.

Environmental precautions

Environmental precautions Collect spillage to prevent release to the environment.

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.

7. HANDLING AND STORAGE

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 minimize combustible dust hazard.

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.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Chemical Name	ACGIH TLV	OSHA PEL
Iron 7439-89-6	-	-
Cobalt 7440-48-4	TWA: 0.02 mg/m ³ TWA: 0.02 mg/m ³ Co	TWA: 0.1 mg/m ³ dust and fume
Nickel 7440-02-0	TWA: 1.5 mg/m ³ inhalable fraction	TWA: 1 mg/m ³
Chromium 7440-47-3	TWA: 0.5 mg/m ³	TWA: 1 mg/m ³
Vanadium 7440-62-2	-	Ceiling: 0.5 mg/m ³ V2O5 respirable dust Ceiling: 0.1 mg/m ³ V2O5 fume
Molybdenum 7439-98-7	TWA: 10 mg/m ³ inhalable fraction TWA: 3 mg/m ³ respirable fraction	-
Tungsten 7440-33-7	STEL: 10 mg/m ³ STEL: 10 mg/m ³ W TWA: 5 mg/m ³ TWA: 5 mg/m ³ W	(vacated) STEL: 10 mg/m ³ (vacated) STEL: 10 mg/m ³ W

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. Wear respiratory protection.

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

Physical state	Solid	Odor	Odorless
Appearance	Powder	Odor threshold	Not applicable
Color	metallic Grey silver		
Property	Values	Remarks • Method	
pH	Not Applicable		
Melting point/freezing point	1320-1400 °C / 2560-2800 °F		
Boiling point / boiling range	-		
Flash point	-		
Evaporation rate	-	Not applicable	
Flammability (solid, gas)	-	Not flammable in the form of this product as distributed, flammable as finely divided particles or pieces resulting from processing of this product	
Flammability Limit in Air		Not applicable	
Upper flammability limit:	Not Applicable		
Lower flammability limit:	Not Applicable		
Vapor pressure	-	Not applicable	
Vapor density	-	Not applicable	
Specific Gravity	8.0-8.5 -		
Water solubility	Insoluble		
Solubility in other solvents	-	Not applicable	
Partition coefficient	-	Not applicable	
Autoignition temperature	-	Not applicable	
Decomposition temperature	-	Not applicable	
Kinematic viscosity	-	Not applicable	
Dynamic viscosity	-	Not applicable	
Explosive properties	Not applicable		
Oxidizing properties	Not applicable		

Other Information

Softening point	Not Applicable
Molecular weight	Not Applicable
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

Dissolves in hydrofluoric acid.

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. Vanadium pentoxide (V2O5) affects eyes, skin, respiratory system. Soluble molybdenum compounds such as molybdenum trioxide may cause lung irritation.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Product Information

Inhalation	May cause cancer by inhalation. Causes damage to respiratory tract through prolonged or repeated exposure if inhaled. Cobalt-containing alloys may cause sensitization by inhalation. Cobalt-containing powders may be fatal if inhaled.
Eye contact	Product not classified.
Skin Contact	May cause sensitization by skin contact.
Ingestion	Harmful if swallowed.

Chemical Name	Oral LD50	Dermal LD50	Inhalation LC50
Iron 7439-89-6	98,600 mg/kg bw	-	> 0.25 mg/L
Cobalt 7440-48-4	550 mg/kg bw	>2000 mg/kg bw	<0.05 mg/L
Nickel 7440-02-0	> 9000 mg/kg bw	-	> 10.2 mg/L
Chromium 7440-47-3	> 3400 mg/kg bw	-	> 5.41 mg/L
Vanadium 7440-62-2	> 2000 mg/kg bw	-	-
Molybdenum 7439-98-7	> 2000 mg/kg bw	> 2000 mg/kg bw	> 5.10 mg/L
Tungsten 7440-33-7	> 2000 mg/kg bw	> 2000 mg/kg bw	> 5.4 mg/L

Information on toxicological effects

Symptoms May cause sensitization 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

Acute toxicity	Harmful if swallowed. Cobalt-containing powders may be fatal if inhaled.
Skin corrosion/irritation	Product not classified.
Serious eye damage/eye irritation	Product not classified.
Sensitization	May cause sensitization by skin contact. Cobalt-containing alloys may cause sensitization by inhalation.
Germ cell mutagenicity	Product not classified.
Carcinogenicity	May cause cancer by inhalation.

Chemical Name	ACGIH	IARC	NTP	OSHA
Cobalt 7440-48-4	A3	Group 2A Group 2B	Known	X
Nickel 7440-02-0		Group 1 Group 2B	Known Reasonably Anticipated	X
Chromium 7440-47-3		Group 3		

Reproductive toxicity	Possible risk of impaired fertility.
STOT - single exposure	Product not classified.
STOT - repeated exposure	Causes disorder and damage to the respiratory system.
Aspiration hazard	Product not classified.

12. ECOLOGICAL INFORMATION

Ecotoxicity

This product as shipped is classified for aquatic chronic toxicity This product as shipped is classified for aquatic acute toxicity

Chemical Name	Algae/aquatic plants	Fish	Toxicity to microorganisms	Crustacea
Iron 7439-89-6	-	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.
Cobalt 7440-48-4	The 72 h EC50 of cobalt dichloride to Pseudokirchneriella subcapitata was 144 ug of Co/L.	The 96h LC50 of cobalt dichloride ranged from 1.5 mg Co/L for Oncorhynchus mykiss to 85 mg Co/L for Danio rerio.	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 Ceriodaphnia dubia tested in soft, DOM-free water to >1800mg Co/L for Tubifex tubifex in very hard water.
Nickel 7440-02-0	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 7440-47-3	-	-	-	-
Vanadium 7440-62-2	The 72 h EC50 of vanadium pentoxide to Desmodesmus subspicatus was 2,907 ug of V/L.	The 96 h LC50 of vanadium pentoxide to Pimephales promelas was 1,850 ug 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 Daphnia magna was 2,661 ug of V/L.
Molybdenum 7439-98-7	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.
Tungsten 7440-33-7	The 72 h EC50 of sodium tungstate to Pseudokirchnerella subcapitata was 31.0 mg of W/L.	The 96 h LC50 of sodium tungstate to Danio rerio 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 Daphnia magna was greater than 96 mg of W/L.

Persistence and degradability

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Bioaccumulation

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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.

Chemical Name	RCRA - D Series Wastes
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Chromium 7440-47-3	5.0 mg/L regulatory level
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This product contains one or more substances that are listed with the State of California as a hazardous waste.

14. TRANSPORT INFORMATION

DOT	Regulated
UN/ID No.	3288
Proper shipping name	Toxic solid, inorganic, n.o.s. (Nickel/cobalt alloy powder)
Hazard Class	6.1
Packing Group	I
Reportable Quantity (RQ)	"(RQ)", if quantity with particles smaller than 100 micrometers (0.004 inches) in an individual package equals or exceeds the Reportable Quantity (RQ) of 5000 pounds of chromium or 100 pounds of nickel.
Special Provisions	Follow Emergency Response Guidebook, Guide No. 152, Except for Fire follow Emergency Response Guidebook, Guide No. 170

15. REGULATORY INFORMATION

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

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

Chemical Name	CAS No.	Weight-%	SARA 313 - Threshold Values %
Cobalt - 7440-48-4	7440-48-4	0-50	0.1
Nickel - 7440-02-0	7440-02-0	0-42	0.1
Chromium - 7440-47-3	7440-47-3	0-40	1.0

SARA 311/312 Hazard Categories

Acute health hazard	Yes
Chronic Health Hazard	Yes
Fire hazard	No
Sudden release of pressure hazard	No
Reactive Hazard	No

CWA (Clean Water Act)

This product contains the following substances which are regulated pollutants pursuant to the Clean Water Act (40 CFR 122.21

and 40 CFR 122.42)

Chemical Name	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants	CWA - Hazardous Substances
Nickel 7440-02-0		X	X	
Chromium 7440-47-3		X	X	

CERCLA

This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302)

Chemical Name	Hazardous Substances RQs
Nickel 7440-02-0	100 lb
Chromium 7440-47-3	5000 lb

US State Regulations**California Proposition 65**

This product contains the following Proposition 65 chemicals

Chemical Name	California Proposition 65
Cobalt - 7440-48-4	Carcinogen
Nickel - 7440-02-0	Carcinogen

U.S. State Right-to-Know Regulations

Chemical Name	New Jersey	Massachusetts	Pennsylvania
Cobalt 7440-48-4	X	X	X
Nickel 7440-02-0	X	X	X
Chromium 7440-47-3	X	X	X
Vanadium 7440-62-2	X	X	X
Molybdenum 7439-98-7	X	X	X
Tungsten 7440-33-7	X	X	X

U.S. EPA Label Information

EPA Pesticide Registration Number Not applicable

16. OTHER INFORMATION

NFPA	Health hazards 2	Flammability 0	Instability 0	Physical and Chemical Properties -
HMIS	Health hazards 3*	Flammability 1	Physical hazards 0	Personal protection X
<i>Chronic Hazard Star Legend</i>	<i>* = Chronic Health Hazard</i>			

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Revision Date 12-Jan-2016

Revision Note

Updated Section 14

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
from:

Safety data sheets and labels available at ATImetals.com