

Issue Date 28-May-2015

Revision Date 05-Aug-2016

Version 5

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

Product identifier

Product Name Nickel Alloy Powder

Other means of identification

Synonyms

Nickel Alloy Powder - Alloy 10 Powder, Alloy 230 Powder, Alloy 230B Powder, Alloy 625 Powder, Alloy 625B Powder, Alloy 720 Powder, Alloy 725 Powder, Alloy 718 Powder

Recommended use of the chemical and restrictions on use

Recommended Use Nickel alloy product manufacture.

Uses advised against

Details of the supplier of the safety data sheet

Manufacturer Address

23661 Birtcher Dr., Lake Forest, CA 92630 U.S.A.

Emergency telephone number

Emergency Telephone Chemtrec: 1- (949) 407-8904

2. HAZARDS IDENTIFICATION

Classification

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

Skin sensitization	Category 1
Carcinogenicity	Category 2
Specific target organ toxicity (repeated exposure)	Category 1
Chronic aquatic toxicity	Category 3

Label elements

Emergency Overview

Danger

Hazard statements

May cause an allergic skin reaction

Suspected of causing cancer

Causes damage to the respiratory tract through prolonged or repeated exposure if inhaled

Harmful to aquatic life with long lasting effects



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

Avoid breathing dust/fume

Avoid release to the environment

Wash contaminated clothing before reuse

If skin irritation occurs: Get medical advice/attention

Contaminated clothing should not be allowed out of the workplace.

IF ON SKIN: Wash with plenty of soap and water

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: Titanium dioxide an IARC Group 2B carcinogen, Hexavalent Chromium (Chromium VI) may cause lung, nasal, and/or sinus cancer, Soluble molybdenum compounds such as molybdenum trioxide may cause lung irritation

3. COMPOSITION/INFORMATION ON INGREDIENTS**Synonyms**

Nickel Alloy Powder, - Alloy 10 Powder, Alloy 230 Powder, Alloy 230B Powder, Alloy 625 Powder, Alloy 625B Powder, Alloy 720 Powder, Alloy 725 Powder, Alloy 718 Powder.

Chemical Name	CAS No.	Weight-%
Nickel	7440-02-0	49->99
Titanium	7440-32-6	0 - 45
Chromium	7440-47-3	8-22
Iron	7439-89-6	0-19
Molybdenum	7439-98-7	0 - 10
Tungsten	7440-33-7	0 - 10
Aluminum	7429-90-5	0 - 5.5
Niobium (Columbium)	7440-03-1	0 - 4.2
Tantalum	7440-25-7	0 - 3.5
Hafnium	7440-58-6	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

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 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**

May cause allergic skin reaction.

Indication of any immediate medical attention and special treatment needed

Note to physicians Treat symptomatically.

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 Titanium dioxide an IARC Group 2B carcinogen, Hexavalent Chromium (Chromium VI) may cause lung, nasal, and/or sinus cancer, 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. 171, 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. 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

Chemical Name	ACGIH TLV	OSHA PEL
Nickel 7440-02-0	TWA: 1.5 mg/m ³ inhalable fraction	TWA: 1 mg/m ³
Titanium 7440-32-6	-	-
Chromium 7440-47-3	TWA: 0.5 mg/m ³	TWA: 1 mg/m ³
Iron 7439-89-6	-	-
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
Molybdenum 7439-98-7	TWA: 10 mg/m ³ inhalable fraction TWA: 3 mg/m ³ respirable fraction	-
Aluminum 7429-90-5	TWA: 1 mg/m ³ respirable fraction	TWA: 15 mg/m ³ total dust TWA: 5 mg/m ³ respirable fraction
Niobium (Columbium) 7440-03-1	-	-
Tantalum 7440-25-7	-	TWA: 5 mg/m ³
Hafnium 7440-58-6	TWA: 0.5 mg/m ³ TWA: 0.5 mg/m ³ Hf	TWA: 0.5 mg/m ³

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

Physical state
Appearance
Color

Solid
Powder
metallic Grey silver

Odor
Odor threshold

Odorless
Not applicable

Property
pH

Values
-

Remarks • Method

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:	-	
Lower flammability limit:	-	
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	-
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

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. Hexavalent Chromium (Chromium VI) may cause lung, nasal, and/or sinus cancer. Soluble molybdenum compounds such as molybdenum trioxide may cause lung irritation.

11. TOXICOLOGICAL INFORMATION**Information on likely routes of exposure**

Product Information

Inhalation	Suspected of causing cancer if inhaled. Causes damage to the respiratory tract through prolonged or repeated exposure if inhaled.
Eye contact	Product not classified.
Skin Contact	May cause sensitization by skin contact.
Ingestion	Product not classified.

Chemical Name	Oral LD50	Dermal LD50	Inhalation LC50
Nickel 7440-02-0	> 9000 mg/kg bw	-	> 10.2 mg/L
Titanium 7440-32-6	> 5000 mg/kg bw	-	-
Chromium 7440-47-3	> 3400 mg/kg bw	-	> 5.41 mg/L
Iron 7439-89-6	98,600 mg/kg bw	-	> 0.25 mg/L
Tungsten 7440-33-7	> 2000 mg/kg bw	> 2000 mg/kg bw	> 5.4 mg/L
Molybdenum 7439-98-7	> 2000 mg/kg bw	> 2000 mg/kg bw	> 5.10 mg/L
Aluminum 7429-90-5	15,900 mg/kg bw	-	> 1 mg/L
Niobium (Columbium) 7440-03-1	> 10,000 mg/kg bw	> 2000 mg/kg bw	-
Tantalum 7440-25-7	> 2000 mg/kg bw	> 2000 mg/kg bw	> 5.18 mg/L
Hafnium 7440-58-6	> 5000 mg/kg bw	-	>4.3mg/L

Information on toxicological effects

Symptoms May cause sensitization 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.
Serious eye damage/eye irritation	Product not classified.
Sensitization	May cause sensitization by skin contact.
Germ cell mutagenicity	Product not classified.
Carcinogenicity	Product not classified.

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

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

12. ECOLOGICAL INFORMATION**Ecotoxicity**

This product as shipped is classified for aquatic chronic toxicity

Chemical Name	Algae/aquatic plants	Fish	Toxicity to microorganisms	Crustacea
Nickel 7440-02-0	NOEC/EC10 values range from 12.3 µg/l for <i>Scenedesmus accuminatus</i> to 425 µg/l for <i>Pseudokirchneriella subcapitata</i> .	The 96 h 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 48 h LC50s values range from 0.013 mg Ni/L for <i>Ceriodaphnia dubia</i> to 4970 mg Ni/L for <i>Daphnia magna</i> .
Titanium 7440-32-6	The 72 h EC50 of titanium dioxide to <i>Pseudokirchneriella subcapitata</i> was 61 mg of TiO ₂ /L.	The 96 h LC50 of titanium dioxide to <i>Cyprinodon variegatus</i> was greater than 10,000 mg of TiO ₂ /L. The 96 h LC50 of titanium dioxide to <i>Pimephales promelas</i> was greater than 1,000 mg of TiO ₂ /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 ₂ /L.
Chromium 7440-47-3	-	-	-	-
Iron 7439-89-6	-	The 96 h LC50 of 50% iron oxide black in water to <i>Danio rerio</i> 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 <i>Daphnia magna</i> was greater than 100 mg/L.
Tungsten 7440-33-7	The 72 h EC50 of sodium tungstate to <i>Pseudokirchneriella 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.
Molybdenum 7439-98-7	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.
Aluminum 7429-90-5	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 Aluminum chloride increased from 0.72 to greater than 99.6 mg/L with water hardness increasing from 25 to 200 mg/L.
Niobium (Columbium) 7440-03-1	-	-	-	-
Tantalum 7440-25-7	-	-	-	-
Hafnium 7440-58-6	The 72 h EC50 of hafnium to <i>Pseudokirchneriella subcapitata</i> was greater than 8 µg of Hf/L (100% saturated solution).	The 96 h LC50 of Hafnium dioxide in water to <i>Danio rerio</i> was greater than the solubility limit of 0.007 mg Hf/L.	-	The 48 h EC50 of Hafnium dioxide to <i>Daphnia magna</i> was greater than the solubility limit of 0.007 mg Hf/L.

Persistence and degradability**Bioaccumulation****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
Chromium 7440-47-3	5.0 mg/L regulatory level

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

14. TRANSPORT INFORMATION**DOT****Proper shipping name****Hazard Class****Packing Group****Special Provisions****Emergency Response Guide Number**

Regulated per 49 CFR, 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, 5000 pounds of copper, or 100 pounds of nickel
 UN/ID No. 3077 Environmentally hazardous substance, solid, n.o.s. (nickel alloy powder), RQ
 9
 III
 8, 146, 335, A112, B54, B120, IB8, IP3, N20, N91, T1, TP33
 Guide No. 171, Except for FIRE follow 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 %
Nickel - 7440-02-0	7440-02-0	49->99	0.1
Chromium - 7440-47-3	7440-47-3	8-22	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
Nickel - 7440-02-0	Carcinogen

U.S. State Right-to-Know Regulations

Chemical Name	New Jersey	Massachusetts	Pennsylvania
Nickel 7440-02-0	X	X	X
Titanium 7440-32-6	X		
Chromium 7440-47-3	X	X	X
Tungsten 7440-33-7	X	X	X
Molybdenum 7439-98-7	X	X	X
Aluminum 7429-90-5	X	X	X
Tantalum 7440-25-7	X	X	X
Hafnium 7440-58-6	X	X	X

U.S. EPA Label Information

EPA Pesticide Registration Number Not applicable

16. OTHER INFORMATION**NFPA**

Health hazards 1

Flammability 0

Instability 0

Physical and Chemical
Properties -**HMIS**

Health hazards 2*

Flammability 1

Physical hazards 0

Personal protection X

Chronic Hazard Star Legend

* = Chronic Health Hazard

Issue Date

28-May-2015

Revision Date

05-Aug-2016

Revision Note

Updated Section(s): 1, 2, 3, 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 samaterials.com