Hastelloy®

1 PRODUCT AND SUPPLIER IDENTIFICATION

Product Name: Hastelloy®
Other: Hastelloy® C276, Hastelloy® C22

Supplier: Stanford Advanced Materials
23661 Birtcher Dr.
Lake Forest, CA 92630 U.S.A.
Telephone: (949)407-8904
Email: sales@samaterials.com

24 HOUR EMERGENCY ASSISTANCE: (949)407-8904

Recommended Uses: Scientific Research

2 HAZARDS IDENTIFICATION

GHS Classification (29 CFR 1910.1200): Not classified as hazardous
GHS Label Elements:
Signal Word: N/A
Hazard Statements: N/A
Precautionary Statements: N/A

3 COMPOSITION/INFORMATION ON INGREDIENTS

Ingredient:	**CAS#**:	**%**:	**EC#**:
Nickel	7440-02-0	50-60	231-111-4
Molybdenum	7439-98-7	12.5-17	231-107-2
Chromium	7440-47-3	14.5-22.5	231-157-5
Iron	7439-89-6	2-7	231-096-4
Tungsten	7440-33-7	2.5-4.5	231-143-9
Cobalt	7440-48-4	<2.5	231-158-0
Manganese	7439-96-5	<1	231-105-1
Vanadium	7440-62-2	<1	231-171-1

4 FIRST AID MEASURES

General Measures: Under normal handling and use, exposure to solid forms of this material present few health hazards. Subsequent operations such as grinding, melting or welding may produce potentially hazardous dust or fumes which can be inhaled or come in contact with the skin or eyes.
INHALATION: Remove to fresh air, keep warm and quiet, give oxygen if breathing is difficult. Seek medical attention.
INGESTION: Rinse mouth with water. Do not induce vomiting. Seek medical attention. Never induce vomiting or give anything by mouth to an unconscious person.
SKIN: Remove contaminated clothing, brush material off skin, wash affected area with soap and water. Seek medical attention if symptoms persist.
EYES: Flush eyes with lukewarm water, including under upper and lower eyelids, for at least 15 minutes. Seek medical attention if symptoms persist.

Most Important Symptoms/Effects, Acute and Delayed: May cause irritation. See section 11 for more information.
Indication of Immediate Medical Attention and Special Treatment: No other relevant information available.

5 FIREFIGHTING MEASURES

Extinguishing Media: Use suitable extinguishing media for surrounding material and type of fire.
Unsuitable Extinguishing Media: No information available.
Specific Hazards Arising from the Material: This product does not present fire or explosion hazards as shipped. Small chips, fine turnings and dust from processing may be ignitable. May emit metal oxide fumes under fire conditions.
Special Protective Equipment and Precautions for Firefighters: Full face, self-contained breathing apparatus and full protective clothing when necessary.

6 ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment, and Emergency Procedures: Wear appropriate respiratory and protective equipment specified in section 8. Avoid dust formation. Avoid contact with skin and eyes. Avoid breathing dust or fume.
Methods and Materials for Containment and Cleaning Up: Sweep or scoop up. Place in a closed container for further handling and disposal. Scrap can be collected for recycling.
Environmental Precautions: Do not allow to enter drains or to be released to the environment.

7 HANDLING AND STORAGE

Precautions for Safe Handling: Avoid creating dust. Provide adequate ventilation if dusts are created. See section 8 for information on personal protection equipment.
Conditions for Safe Storage: Store in a sealed container. Store in a cool, dry area. See section 10 for more information on incompatible materials.

8 EXPOSURE CONTROLS AND PERSONAL PROTECTION

Exposure Limits:	**OSHA/PEL**:	**ACGIH/TLV**:
Nickel	1 mg/m^3	1.5 mg/m^3
Molybdenum	15 mg/m^3 (insoluble compounds, total dust)	10 mg/m^3 (insoluble compounds, inhalable)
Chromium	1 mg/m^3	0.5 mg/m^3
Iron	No exposure limit established	No exposure limit established
Tungsten	5 mg/m^3	5 mg/m^3
Cobalt	0.1 mg/m^3	0.02 mg/m^3
Manganese	5 mg/m^3	0.2 mg/m^3
Vanadium	No exposure limit established	No exposure limit established

Engineering Controls: Ensure adequate ventilation to maintain exposures below occupational limits. Whenever possible the use of local exhaust ventilation or other engineering controls is the preferred method of controlling exposure to airborne dust and fume to meet established occupational exposure limits. Use good housekeeping and sanitation practices. Do not use tobacco or food in work area. Wash thoroughly before eating or smoking. Do not blow dust off clothing or skin with compressed air.
Respiratory Protection: If permissible levels are exceeded, use NIOSH approved dust respirator.
Eye Protection: Safety glasses
Skin Protection: Wear impermeable gloves, protective work clothing as necessary.

9 PHYSICAL AND CHEMICAL PROPERTIES

Appearance:
Form: Solid in various forms

Color: Silver-gray metallic
Odor: Odorless
Odor Threshold: Not determined
pH: N/A
Melting Point: ~1325 °C - 1370 °C
Boiling Point: No data
Flash Point: N/A
Evaporation Rate: N/A
Flammability: No data
Upper Flammable Limit: No data
Lower Flammable Limit: No data
Vapor Pressure: No data
Vapor Density: N/A
Relative Density (Specific Gravity): ~8.9 g/cc
Solubility in H_2O: Insoluble
Partition Coefficient (n-octanol/water): Not determined
Autoignition Temperature: No data
Decomposition Temperature: No data
Viscosity: N/A

10 STABILITY AND REACTIVITY

Reactivity: No data
Chemical Stability: Stable under recommended storage conditions.
Possibility of Hazardous Reactions: No data
Conditions to Avoid: Avoid creating or accumulating fines or dusts.
Incompatible Materials: Acids, oxidizers.
Hazardous Decomposition Products: Metal oxide fume.

11 TOXICOLOGICAL INFORMATION

Likely Routes of Exposure: Inhalation, skin, eyes. Product as shipped does not present an inhalation hazard; however subsequent operations may create dusts or fumes which could be inhaled.
Symptoms of Exposure: Fines/dusts may irritate skin and eyes.
Acute and Chronic Effects:
Nickel: The most common harmful health effect of metallic nickel in humans is an allergic skin reaction in those who are sensitive to nickel. Although nickel compounds are known human carcinogens, the evidence suggests that the relatively insoluble metallic nickel is less likely to present a carcinogenic hazard than are the nickel compounds that tend to release proportionately more nickel ion.
Molybdenum: No data
Chromium: Although much is known about the health effects of chromium compounds, the health effects of chromium metal, Cr(0), is not well studied. Due to insolubility most elements in their metallic state are not considered to be serious health hazards.
Iron: Irritating to the respiratory tract, iron compounds may cause pulmonary fibrosis if dusts are inhaled. Inhalation of large amounts may cause iron pneumoconiosis. Chronic inhalation of finely divided powder may cause chronic iron poisoning and pathological deposition of iron in the body tissue. Ingestion may cause vomiting, diarrhea, pink urine, black stool, and liver damage. Iron compounds may also cause damage to the kidneys.
Tungsten: No data
Cobalt: Acute exposure to cobalt metal dusts or fumes is characterized by irritation to the eyes, and to a lesser extent, irritation to the skin. Chronic exposure to cobalt metal dust or fumes may cause respiratory and dermatologic signs and symptoms. Chronic exposure to cobalt by inhalation in humans' results in effects on the respiratory system, such as respiratory irritation, wheezing, asthma, decreased lung function, pneumonia, and fibrosis.

Manganese: Chronic inhalation exposure of humans to high levels of manganese may result in a syndrome called manganism which typically begins with feelings of weakness and lethargy and progresses to other symptoms such as gait disturbances, clumsiness, tremors, speech disturbances, a mask-like facial expression and psychological disturbances. Manganese is an essential micronutrient in humans.
Vanadium: No data
Acute Toxicity: No data
Carcinogenicity: **Nickel**: **NTP**: R - reasonably anticipated to be a human carcinogen **IARC**: 2B - possibly carcinogenic to humans
To the best of our knowledge the chemical, physical and toxicological characteristics of the substance are not fully known.

12 ECOLOGICAL INFORMATION

Ecotoxicity: No data
Persistence and Degradability: No data
Bioaccumulative Potential: No data
Mobility in Soil: No data
Other Adverse Effects: No further relevant information available.

13 DISPOSAL CONSIDERATIONS

Waste Disposal Method:
Product: Dispose of in accordance with Federal, State and Local regulations.
Packaging: Dispose of in accordance with Federal, State and Local regulations.

14 TRANSPORT INFORMATION

DOT/ADR/IATA/IMDG Regulations: Not regulated
UN Number: N/A
UN Proper Shipping Name: N/A
Transport Hazard Class: N/A
Packing Group: N/A
Marine Pollutant: No
Special Precautions: N/A

15 REGULATORY INFORMATION

TSCA Listed: All components are listed.
Regulation (EC) No 1272/2008 (CLP): N/A
Canada WHMIS Classification (CPR, SOR/88-66): N/A
HMIS Ratings: **Health**: 0 **Flammability**: 0 **Reactivity**: 0
NFPA Ratings: **Health**: 0 **Flammability**: 0 **Reactivity**: 0
Chemical Safety Assessment: A chemical safety assessment has not been carried out.

16 OTHER INFORMATION

Hastelloy® is a registered trademark of Haynes International, Inc.
The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. Stanford Advanced Materials shall not be held liable for any damages resulting from handling or from contact with the above product.

Prepared by: Stanford Advanced Materials
Revised/Reviewed: November 2014
24 HOUR EMERGENCY ASSISTANCE: (949) 407-8904