STANFORD
ADVANCED MATERIALS

SAFETY DATA SHEET

1 PRODUCT AND SUPPLIER IDENTIFICATION

Product Name: Inconel® - sheet, foil, rod, wire, pellets, target

Supplier: Stanford Advanced Materials
23661 Birtcher Dr.
Lake Forest, CA 92630

Telephone: +1 (949) 407-8904

Fax: +1 (949) 812-6690

Emergency: +1 (949) 407-8904

Recommended Uses: Scientific Research

2 HAZARDS IDENTIFICATION

GHS Classification (29 CFR 1910.1200): Not classified as hazardous

GHS Label Elements: N/A

Hazards Not Otherwise Classified: N/A

Other Hazard Information: 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 dust or fumes. Inhalation of fumes may cause metal fume fever. The symptoms of metal fume fever are generally nonspecific flulike complaints including fever, chills, nausea, fatigue, muscle ache, and joint pain. Dusts may irritate lungs, eyes or abraded skin.

3 COMPOSITION / INFORMATION ON INGREDIENTS

Ingredient:	CAS#:	%:	EC#:
Nickel	7440-02-0	50-72	231-111-4
Chromium	7440-47-3	14-23	231-157-5
Iron	7439-89-6	5-22	231-096-4
Molybdenum	7439-98-7	2-10	231-107-2
Niobium	7440-03-1	3-6	231-113-5
Cobalt	7440-48-4	1	231-158-0

Common Names and Synonyms: Nickel Alloy 600, 625, 718, X750

4 FIRST AID MEASURES

General Measures: No special requirements.

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. Isolate spill area and provide ventilation. Avoid breathing dust or fume. Avoid contact with skin and eyes. Eliminate all sources of ignition if dusts are present.

Methods and Materials for Containment and Cleaning Up: Avoid dust formation. Sweep or scoop up. Place in a properly labeled container for further handling and disposal.

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. Avoid breathing dust or fumes. Provide adequate ventilation if dusts are created. Avoid contact with skin and eyes. Wash thoroughly before eating or smoking. See section 8 for information on personal protection equipment.

Conditions for Safe Storage: 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
Chromium	1 mg/m^3	0.5 mg/m^3
Iron (III) Oxide	10 mg/m^3 (fume)	5 mg/m^3 (respirable)

Molybdenum	15 mg/m^3 (insol. compounds, total dust)	10 mg/m^3 (insol. compounds, inhalable)
Niobium	No exposure limit established	No exposure limit established
Cobalt	0.1 mg/m^3	0.02 mg/m^3

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.

Individual Protection Measures, Such as Personal Protective Equipment:

Respiratory Protection: Use suitable respirator when dust or fumes are present.

Eye Protection: Safety glasses

Skin Protection: 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: ~1400 ^oC

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 specific test data available.

Chemical Stability: Stable under recommended storage and handling conditions.

Possibility of Hazardous Reactions: Hazardous polymerization will not occur.

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.

Symptoms of Exposure: Fines/dusts may irritate lungs, eyes or abraded skin. Inhalation of metal oxide fumes due to heating beyond the boiling point in an oxidizing atmosphere, such as when smelting or welding, may cause substernal chest pain, cough, dyspnea and flu-like symptoms. The respiratory symptoms generally disappear in the exposed individual within 1-4 days.

Acute and Chronic Effects: No adverse effects are expected from normal handling of this material in its solid form.

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.

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: If inhaled, iron is a local irritant to the lung and gastrointestinal tract. 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.

Molybdenum: When rats inhaled dusts of metallic molybdenum for 1 hour at 25 to 30 g/cu m ... there were no changes in the condition of the animals observed in the 4 weeks following exposure.

Tungsten: No ill effects were observed in patients given 25-80 g powdered tungsten metal by mouth as substitute for barium in radiological examinations. Long industrial experience has indicated no pneumoconiosis to develop among workers exposed solely to tungsten. Powdered tungsten may cause mechanical skin and/or eye irritation.

Niobium: The biocompatibility of niobium metal is similar to that of tantalum, which is generally considered to be physiologically inert.

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.

Acute Toxicity: No data

Carcinogenicity:

Nickel: **NTP**: R-reasonably anticipated to be a human carcinogen **IARC**: 2B-possibly carcinogenic to humans

Chromium: **NTP**: Not identified as carcinogenic **IARC**: 3 - Not classifiable as to carcinogenicity in humans

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

Shipping Regulations: Not regulated

15 REGULATORY INFORMATION

TSCA Listed: All components are listed.

Regulation (EC) No 1272/2008 (CLP): N/A

WHMIS 2015 Classification: N/A

HMIS Ratings: **Health**: 0 **Flammability**: 0 **Physical**: 0

NFPA Ratings: **Health**: 0 **Flammability**: 0 **Instability**: 0

Chemical Safety Assessment: A chemical safety assessment has not been carried out.

16 OTHER INFORMATION

This material safety data sheet is offered solely for your information, consideration, and investigation. Stanford Advanced Materials provides no warranties, either express or implied, and assumes no responsibility for the accuracy or completeness of the data contained herein.