

SAFETY DATA SHEET

1. SUBSTANCE AND SOURCE IDENTIFICATION

Product Identifier

SRM Number: 1247
SRM Name: Ni-Fe-Cr Alloy UNS N08825 (disk form)
Other Means of Identification: Not applicable.

Recommended Use of This Material and Restrictions of Use

This Standard Reference Material (SRM) is intended primarily for use in validation of chemical and instrumental methods of analysis. It can be used to validate value assignment of in-house reference materials. SRM 1247 is a high temperature alloy in wrought form. A unit of SRM 1247 consists of a single disk with approximate dimensions of 35 mm diameter and 19 mm thick.

Company Information

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2. HAZARDS IDENTIFICATION

This SRM is an Article, as the word is defined by OSHA, where Article means a manufactured item other than a fluid or particle: (i) which is formed to a specific shape or design during manufacture; (ii) which has end use function(s) dependent in whole or in part upon its shape or design during end use; and (iii) which under normal conditions of use does not release more than very small quantities, e.g., minute or trace amounts of a hazardous chemical (as determined under paragraph (d) of 1910.1200), and does not pose a physical hazard or health risk to employees. Information is provided in sections following for exposure to possible dust or fumes generated from the individual components during surface preparation.

Classification

Physical Hazard: Not classified.
Health Hazard: Not classified.

Label Elements

Symbol: No symbol or pictogram.
Signal Word: No signal word.
Hazard Statement(s): Not applicable.
Precautionary Statement(s): Not applicable.
Hazards Not Otherwise Classified: Not applicable.
Ingredients(s) with Unknown Acute Toxicity: Not applicable.

3. COMPOSITION AND INFORMATION ON HAZARDOUS INGREDIENTS

Substance: Ni-Fe-Cr Alloy UNS N08825
Other Designations: Incoloy® 825

NOTE: Components are listed in compliance with OSHA's 29 CFR 1910.1200. For actual values, see the NIST Certificate of Analysis.

Hazardous Component(s)	CAS Number	EC Number (EINECS)	Nominal Mass Concentration (%)
Nickel	7440-02-0	231-111-4	43.5
Iron	7439-89-6	231-096-4	26.5
Chromium	7440-47-3	231-157-5	23.4
Molybdenum	7439-98-7	231-107-2	2.7
Copper	7440-50-8	231-159-6	1.8

4. FIRST AID MEASURES

Description of First Aid Measures:

Inhalation: In case of exposure to fumes or particulates: Get medical attention immediately.

Skin Contact: Wash skin with water for at least 15 minutes. Get medical attention if irritation persists after washing. In case of allergic reaction or other skin disorders: Seek medical attention and bring along these instructions.

Eye Contact: Do not rub eyes. Flush eyes with water for at least 15 minutes. If necessary, seek medical attention.

Ingestion: Rinse mouth thoroughly if dust is ingested. Only induce vomiting at the instruction of medical personnel. Get medical attention if any discomfort continues.

Most Important Symptoms/Effects, Acute and Delayed: May cause irritation to mucous membranes. May cause sensitization.

Indication of any immediate medical attention and special treatment needed, if necessary: If any of the above symptoms are present, seek medical attention if needed.

5. FIRE FIGHTING MEASURES

Fire and Explosion Hazards: Negligible fire and explosion hazard in bulk form. Dust/air mixtures may ignite or explode. See Section 9, "Physical and Chemical Properties" for flammability properties.

Extinguishing Media:

Suitable: Dolomite, dry powder for metal fires, dry sand, graphite, soda ash, sodium chloride.

Unsuitable: Do not get water directly on material.

Specific Hazards Arising from the Chemical: None listed.

Special Protective Equipment and Precautions for Fire-Fighters: Avoid inhalation of material or combustion byproducts. Wear full protective clothing and NIOSH approved self-contained breathing apparatus (SCBA).

NFPA Ratings (0 = Minimal; 1 = Slight; 2 = Moderate; 3 = Serious; 4 = Severe)

Health = 2

Fire = 3

Reactivity = 0

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment and Emergency Procedures: Avoid dust formation. Keep unnecessary personnel away. Use suitable protective equipment; see Section 8, "Exposure Controls and Personal Protection".

Methods and Materials for Containment and Clean up: Notify safety personnel of spills. Collect spilled material in appropriate container for disposal. Isolate hazard area and deny entry.

7. HANDLING AND STORAGE

Safe Handling Precautions: See Section 8, “Exposure Controls and Personal Protection”.

Storage: Store and handle in accordance with all current regulations and standards. Keep separated from incompatible substances (see Section 10, “Stability and Reactivity”).

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Exposure Limits			
Components	OSHA (PEL)	ACGIH (TLV)	NIOSH (REL)
Nickel	TWA: 1 mg/m ³	TWA: 1.5 mg/m ³ (inhalable fraction)	TWA: 0.015 mg/m ³ IDLH: 10 mg/m ³
Chromium	TWA: 1 mg/m ³	TWA: 0.5 mg/m ³	TWA: 0.5 mg/m ³ IDLH: 250 mg/m ³
Iron	No occupational exposure limits established.		
Copper	TWA: 0.1 mg/m ³ (dust and fume)	TWA: 0.2 mg/m ³ (fume)	TWA: 1 mg/m ³ (dust and mist) TWA: 0.1 mg/m ³ (fume) IDLH: 100 mg/m ³ (dust, fume, and mist)
Molybdenum	No occupational exposure limits established.	TWA: 10 mg/m ³ (inhalable fraction) TWA: 3 mg/m ³ (respirable fraction)	IDLH: 5000 mg/m ³

Engineering Controls: Provide local exhaust or process enclosure ventilation system. Ensure compliance with applicable exposure limits.

Personal Protection: In accordance with OSHA 29 CFR 1910.132, subpart I, wear appropriate Personal Protective Equipment (PPE) to minimize exposure to this material.

Respiratory Protection: If workplace conditions warrant a respirator, a respiratory protection program that meets OSHA 29CFR 1910.134 must be followed. Refer to NIOSH 42 CFR 84 for applicable certified respirators.

Eye/Face Protection: Wear chemical resistant safety goggles. An eyewash station should be readily available near areas of use.

Skin and Body Protection: Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. Chemical-resistant gloves should be worn at all times when handling chemicals.

9. PHYSICAL AND CHEMICAL PROPERTIES

Note: Information is provide for iron nickel alloy as no properties are available for the Ni-Fe-Cr Alloy.

Descriptive Properties	Nickel Alloy
Appearance (physical state, color, etc.)	solid disk, 35 mm diameter and 19 mm thick
Molecular Formula	not available
Molar Mass (g/mol)	not available
Odor	not available
Odor Threshold	not available
pH	not available
Evaporation Rate	not available
Melting Point/Freezing Point	>1093 °C (>2000 °F)
Relative Density as specific gravity (water = 1)	not available
Vapor Pressure	not available
Vapor Density (air = 1)	not available
Viscosity	not available
Solubility(ies)	insoluble in water; soluble in nitric acid and hydrofluoric acid

Descriptive Properties	Nickel Alloy
Partition Coefficient (n-octanol/water)	not available
Particle Size	not applicable
Thermal Stability Properties	
Autoignition Temperature	not applicable
Thermal Decomposition	not applicable
Initial Boiling Point and Boiling Range	2871 °C (5200 °F)
Explosive Limits, LEL	not available
Explosive Limits, UEL	not available
Flash Point	not available
Flammability (solid, gas)	not available

10. STABILITY AND REACTIVITY

Reactivity: Stable at normal temperatures and pressure.

Stability: Stable Unstable

Possible Hazardous Reactions: No data available.

Conditions to Avoid: Avoid generating dust, avoid heat, flames, sparks, and other sources of ignition.

Incompatible Materials: Combustible materials, oxidizing materials, halogens, acids, peroxides, metals, bases, and reducing agents.

Fire/Explosion Information: See Section 5, "Fire Fighting Measures".

Hazardous Decomposition: Oxides of nickel, iron, chromium, and other metal compounds.

Hazardous Polymerization: Will Occur Will Not Occur

11. TOXICOLOGICAL INFORMATION

Route of Exposure: Inhalation Skin Ingestion

Symptoms Related to the Physical, Chemical and Toxicological Characteristics: Respiratory tract irritation and skin sensitization.

Potential Health Effects (Acute, Chronic and Delayed):

Inhalation: Dust or fumes may cause respiratory tract irritation. Elevated temperatures or mechanical action may form dust and fumes which may be irritating to the mucous membranes and respiratory tract.

Skin Contact: May cause an allergic skin reaction. Hot or molten material may produce thermal burns. Workers allergic to nickel may develop eczema or rashes.

Eye Contact: Contact with dust may cause eye irritation.

Ingestion: Ingestion of dusts generated during working operations may cause nausea and vomiting.

Numerical Measures of Toxicity:

Acute Toxicity: Not classified.

Copper: Mouse, Oral LD50: 413 mg/kg; >5000 mg/kg.

Iron: Rat, Oral LD50: 984 mg/kg; 750 mg/kg; 30 g/kg.

Nickel: Rat, Oral, LD50: >9000 mg/kg.

Skin Corrosion/Irritation: Not classified; no data available.

Serious Eye Damage/Irritation: Not classified; no data available.

Respiratory Sensitization: Not classified; no data available.

Skin Sensitization: Not classified. This material is an article and prolonged contact with the material is not expected. This material contains nickel which if processed into dust or fumes may cause contact dermatitis in individuals known to be sensitized to nickel.

Germ Cell Mutagenicity: Not classified; no data available.

Carcinogenicity: Not classified, material is an article.

Listed as a Carcinogen/Potential Carcinogen _____ Yes X No

Nickel alloys are not listed by NTP; IARC lists nickel, metallic and alloys in Group 2B (possibly carcinogenic to humans).

Mutagenic data: 5 µmol/L hamster; 400 mg/L hamster.

Chromium metal is listed as Group 3, *not classifiable*, by IARC. Chromium metal is not listed by NTP or OSHA.

Mutagenic data: 1 µmol/L human.

Reproductive Toxicity: Not classified.

Nickel, Rat, Oral TDLo: 158 mg/kg (multigeneration)

Copper, Rat, Oral TDLo: 1520 µg/kg (prior to copulation 22 weeks)

Specific Target Organ Toxicity, Single Exposure: Not classified; no data available.

Specific Target Organ Toxicity, Repeated Exposure: Not classified; no data available.

Aspiration Hazard: Not applicable.

12. ECOLOGICAL INFORMATION

Ecotoxicity Data:

Nickel: Fish, Carp (*Cyprinus carpio*), LC50 (96 h): 1.3 mg/L [semi-static]

Algae (*Pseudokirchneriella subcapitata*) EC50 (96 h): 0.174 to 0.311 mg/L [static]

Invertebrate, water flea (*Daphnia magna*) EC50 (48 h): 1 mg/L [static]

Copper: Fish, Fathead minnow (*Pimephales promelas*) LC50 (96 h): <0.3 mg/L [static]

Algae (*Pseudokirchneriella subcapitata*) EC50 (72 h): 0.0426 to 0.0535 mg/L [static]

Invertebrate, water flea (*Daphnia magna*) EC50 (48 h): 0.03 mg/L [static]

Persistence and Degradability: No data available.

Bioaccumulative Potential: No data available.

Mobility in Soil: Alloys in massive forms are not mobile in the environment.

Other Adverse effects: No data available.

13. DISPOSAL CONSIDERATIONS

Waste Disposal: Dispose of waste in accordance with all applicable federal, state, and local regulations. Chromium subject to U.S. EPA 40 CFR 262 for concentrations at or above the regulatory level of 5.0 mg/L.

14. TRANSPORTATION INFORMATION

U.S. DOT and IATA: Not regulated by DOT or IATA.

15. REGULATORY INFORMATION

U.S. Regulations:

CERCLA Sections 102a/103 (40 CFR 302.4):

Nickel: 100 lb (45.4 kg) final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal is released is > 100 µm.

Chromium: 5000 lb (2270 kg) final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal is released is > 100 µm.

Copper: 5000 lb (2270 kg) final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal is released is > 100 µm.

SARA Title III Section 302 (40 CFR 355.30): Not regulated.

SARA Title III Section 304 (40 CFR 355.40): Not regulated.

SARA Title III Section 313 (40 CFR 372.65):

Nickel: 0.1 % Supplier notification limit; 0.1 % de minimis.

Chromium: 1% de minimis concentration.

Copper: 1% de minimis concentration.

OSHA Process Safety (29 CFR 1910.119): Not regulated.

SARA Title III Sections 311/312 Hazardous Categories (40 CFR 370.21):

ACUTE HEALTH: No.
CHRONIC HEALTH: Yes.
FIRE: No.
REACTIVE: No.
PRESSURE: No.

State Regulations:

California Proposition 65: WARNING! This product contains chemical (nickel) known to the state of California to cause cancer.

U.S. TSCA Inventory: Chromium, iron, nickel, copper and molybdenum are listed.

TSCA 12(b), Export Notification: Not listed.

Canadian Regulations: WHMIS information: is not provided for this material.

16. OTHER INFORMATION

Issue Date: 11 September 2015

Sources: ChemAdvisor, Inc., SDS *Ferronickel*, 20 March 2015.

ChemAdvisor, Inc., SDS *Ferrochromium*, 20 March 2015.

ChemAdvisor, Inc., SDS *Molybdenum*, 20 March 2015.

Key of Acronyms:

ACGIH	American Conference of Governmental Industrial Hygienists	NTP	National Toxicology Program
CAS	Chemical Abstracts Service	OSHA	Occupational Safety and Health Administration
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act	PEL	Permissible Exposure Limit
CFR	Code of Federal Regulations	RCRA	Resource Conservation and Recovery Act
DOT	Department of Transportation	REL	Recommended Exposure Limit
EINECS	European Inventory of Existing Commercial Chemical Substances	RQ	Reportable Quantity
EPCRA	Emergency Planning and Community Right-to-Know Act	RTECS	Registry of Toxic Effects of Chemical Substances
IARC	International Agency for Research on Cancer	SARA	Superfund Amendments and Reauthorization Act
IATA	International Air Transportation Agency	SCBA	Self-Contained Breathing Apparatus
IDLH	Immediately Dangerous to Life and Health	SRM	Standard Reference Material
LC50	Lethal Concentration	STEL	Short Term Exposure Limit
LD50	Median Lethal Dose or Lethal Dose, 50 %	STOT	Specific Target Organ Toxicity
LEL	Lower Explosive Limit	TLV	Threshold Limit Value
MSDS	Material Safety Data Sheet	TPQ	Threshold Planning Quantity
NFPA	National Fire Protection Association	TSCA	Toxic Substances Control Act
NIOSH	National Institute for Occupational Safety and Health	TWA	Time Weighted Average
NIST	National Institute of Standards and Technology	UEL	Upper Explosive Limit
n.o.s.	Not Otherwise Specified	WHMIS	Workplace Hazardous Materials Information System

Disclaimer: Physical and chemical data contained in this SDS are provided only for use in assessing the hazardous nature of the material. The SDS was prepared carefully, using current references; however, NIST does not certify the data in the SDS. The certified values for this material are given in the NIST Certificate of Analysis.

Users of this SRM should ensure that the SDS in their possession is current. This can be accomplished by contacting the SRM Program: telephone (301) 975-2200; fax (301) 948-3730; e-mail srmmsds@nist.gov; or via the Internet at <http://www.nist.gov/srm>.