

MATERIAL SAFETY DATA SHEET

SECTION 1 – PRODUCT IDENTIFICATION

Product Name: **Chromium Carbide - Nickel Chromium (75/25) Powder**
 Product Item: 312375
 Product Code: HA 2375

Supplier: **HAI Advanced Material Specialists, Inc.**
1688 Sierra Madre Circle
Placentia, CA 92870
(714)-414-0575

Emergency Contact: 888-255-3924
 Chemical Family: Metal Carbide, Metal Alloy
 Formula: Cr_3C_2 -25%NiCr
 Molecular Weight:

SECTION 2 – HAZARDOUS INGREDIENTS

IMPORTANT! This section covers the material from which these products are manufactured. Dust and gases produced when spraying with normal use of these products are covered in Section 5.

Material or Component	CAS Number	Concentration	OSHA PEL	ACGIH TVL	Other Limits *
Chromium carbide	12012-35-0	0.0 - 80.0 %	1 mg/m ³	0.5 mg/m ³	NE
Nickel	7440-02-0	0.0 - 30.0 %	1 mg/m ³	1 mg/m ³	NE
Chromium	7440-47-3	0.0 - 20.0 %	1 mg/m ³	0.5 mg/m ³	NE
Material or Component	RTECS #	OSHA STEL	OSHA CEIL	ACGIH STEL	ACGIH STEL
Nickel	QR5950000	No data.	No data.	No data.	No data.
Chromium	GB4200000	No data.	No data.	No data.	No data.

US EPA SARA TITLE III

Material or Component	CAS Number	Sec. 302 (EHS)	Sec. 304 RQ	Sec. 313 (TRI)
Chromium carbide	12012-35-0	No	Yes 1 LB**	Yes
Nickel	7440-02-0	No	Yes 100 LB	Yes
Chromium	7440-47-3	No	Yes 5000 LB	Yes

SECTION 3 – PHYSICAL/CHEMICAL CHARACTERISTICS

Physical States: Gas Liquid Solid
Melting Point: >1,500°C
Boiling Point: No data
Specific gravity (water=1): No data
Vapor pressure (mmHg): No data
Vapor Density (Air=1): No data

Evaporation rate (Butylacetate=1): No data
Solubility in water: Insoluble
Percent volatile (vol.): No data
Corrosion Rate: No data
Appearance and odor: Gray metallic powder, no odor
Other: None

SECTION 4 – FIRE AND EXPLOSION HAZARD DATA

Flash point: N/A Method Used: Unknown
Auto ignition temp.: For nickel: 400 C for powder
Flammable limits: N/A
Explosive Limits: LEL: N/A UEL: N/A
Extinguishing Media: DO NOT USE WATER.
 Use graphite, dry sodium chloride, dry chemical or an special agent to extinguish metal fires. If fire occurs in open drums, seal drum with lid to smother flames.
Special fire fighting procedures: Firefighters must wear full face, self-contained breathing apparatus with full protective clothing to prevent contact with skin and eyes. Fumes from fire are hazardous. Isolate runoff to prevent environmental pollution.
Unusual fire and explosion hazards: Dust may present fire or explosion hazard in confined areas. This is not expected under normal handling procedures.
 CHROMIUM CARBIDE: May emit toxic fumes if involved in a fire. On contact with moisture, it may emit methane gas
 NICKEL: Contact with strong acids may form flammable and explosive hydrogen gas. Contact with sulfur may cause evolution of heat. Nickel reacts violently with fluorine, ammonium nitrate, hydrazine, ammonia, (H₂+dioxane), performic acid, phosphorous, selenium, sulfur and (Ti+KClO₃). Powders may ignite spontaneously in air.
 CHROMIUM: Ignites and is potentially explosive in atmospheres of carbon dioxide. Chromium reacts violently or explosively when heated with ammonium nitrate and bromine pentafluoride. Chromium has an incandescent reaction with nitrogen oxide or sulfur dioxide. Powders will explode spontaneously in air.

SECTION 5 – REACTIVITY DATA

Stability: Unstable [] Stable [X]
Conditions to avoid - Instability: Accumulation of fine powder, below 1µm
Incompatibility – Materials to avoid: Moisture, strong oxidizing agents, acids and bases
 NICKEL: Oxidizing agents, sulfur compounds, hydrogen and oxygen, magnesium silicate, methanol, organic solvents, aluminum, aluminum chloride, ethylene, p-dioxane, strong acids, wood and other combustibles.
 CHROMIUM: Strong oxidizing agents, ammonium nitrite, bromine pentafluoride and carbon dioxide.
Hazardous decomposition products: CHROMIUM CARBIDE: Methane gas
 NICKEL: Nickel carbonyl, oxides of nitrogen, hydrogen gas.
Hazardous polymerization: Will occur [] Will not occur [X]
Conditions to avoid – Hazardous polymerization: None
Product corrosive: Yes [] No [X]

SECTION 6 – HEALTH HAZARD DATA

Health Hazards (Acute and Chronic)

To the best of our knowledge the chemical, physical and toxicological properties of tungsten carbide cobalt alloy have not been thoroughly investigated and recorded.

NICKEL: Confirmed carcinogen with experimental carcinogenic, neoplastigenic, tumorigenic and teratogenic data. Poison by ingestion, intratracheal, intraperitoneal, subcutaneous and intravenous routes. An experimental teratogen. Ingestion of soluble salts causes nausea, vomiting and diarrhea. Hypersensitivity to nickel is common and can cause allergic contact dermatitis, pulmonary asthma, conjunctivitis and inflammatory reactions around nickel containing medical implants and prosthesis. (Sax, Dangerous Properties of Industrial Materials, eighth edition).

CHROMIUM: Confirmed human carcinogen with experimental tumorigenic data. Human poison by ingestion with gastrointestinal effects. (Sax, Dangerous Properties of Industrial Materials)

Inhalation: Acute: May cause irritation.
Nickel may cause irritation to the upper respiratory tract, nasal cavities and pulmonary asthma.

Chronic: Nickel may cause pneumonitis.
Chromium may cause histologic fibrosis of lungs, nasal and/or lung cancer.

Ingestion: Acute: Poison by ingestion. Large doses may cause intestinal disorders, convulsions and asphyxia.

Chromium may cause gastrointestinal effects.

Chronic: May cause nickel toxicity

Skin: Acute: May cause irritation.

Chronic: Nickel may sensitize the skin (nickel itch). May cause allergic dermatitis, eczematous dermatitis and may be accompanied a week later with superficial skin ulcers, which may discharge and become crusted.

Eye: Acute: May cause irritation.

Chronic: May cause conjunctivitis.

Target Organs: May affect the respiratory system. Nickel may affect the nasal cavities, lungs and skin. Chromium may affect the respiratory system.

Carcinogenicity: NTP? [X] ARC Monographs? [X] OSHA Regulated? [X]

Carcinogenicity / other Information:

NICKEL:

otr-ham:kdy 400 mg/L orl-rat TDLo: 158 mg/kg (MGN):TER

otr-ham:emb 5 umol/L scu-rat TDLo: 3000 mg/kg/6W-I:ETA

ims-rat TDLo: 56 mg/kg:CAR par-rat TDLo: 40 mg/kg/52W-I:ETA

imp-rat TDLo: 250 mg/kg:CAR ims-mus TDLo: 200 mg/kg:NEO

imp-rbt TDLo: 165 mg/kg/2Y-I:NEO,TER orl-rat LDLo: 5 g/kg

itr-rat LDLo: 12 mg/kg ivn-mus LDLo: 50 mg/kg

ivn-dog LDLo: 10 mg/kg scu-rat LDLo: 12500 ug/kg

ipr-rbt LDLo: 7 mg/kg scu-rbt LDLo: 7500 ug/kg

orl-gpg LDLo: 5 mg/kg

CHROMIUM:

ivn-rat TDLo: 2160 ug/kg/6W-I:ETA imp-rat TDLo: 1200 ug/kg/6WI TFX:ETA

orl-hmn LDLo: 71 mg/kg:GIT imp-rbt TDLo: 75 mg/kg: ETA

Recommended Exposure Limits

See "Section II"

LD 50 / LC 50

See "Carcinogenicity/Other Information"

Signs and Symptoms of Exposure

- Inhalation:** May cause a red, dry throat, coughing, sneezing, soreness in the chest, shortness of breath.
- Ingestion:** May cause gastritis, convulsions, asphyxia, giddiness, nausea, diarrhea and vomiting. Nickel toxicity may cause: gastroenteritis; Nervous symptoms such as tremor, chorea-like movements and paralysis occur prior to death, which occurs mostly from heart failure.
- Skin:** May cause red, itching, swelling, burning and ulcers.
- Eye:** May cause redness, itching, burning, and watering.

Medical Conditions Generally Aggravated by Exposure

Pre-existing respiratory disorders, pulmonary functions, asthma and skin disorders.

Emergency and First Aid Procedures

- Inhalation:** Remove victim to fresh air; keep warm and quiet; give oxygen if breathing is difficult and seek medical attention.
- Ingestion:** Give 1-2 glasses of milk or water and induce vomiting; seek medical attention. Never induce vomiting or give anything by mouth to an unconscious person.
- Skin:** If contacted with skin remove any contaminated clothing, brush material off skin; wash skin thoroughly with soap and water, seek medical attention immediately.
- Eye:** If contact with eye occurs, flush eyes with lukewarm water, lifting upper and lower eyelids, for at least 15 minutes. Seek medical attention immediately.

SECTION 7 - PRECAUTIONS FOR SAFE HANDLING AND USE/DISPOSAL

Steps to be Taken in Case Material is Released or Spilled

Wear appropriate respiratory and protective equipment specified in section 8-control measures. Isolate spill area and provide ventilation. Vacuum up spill using a high efficiency particulate absolute (HEPA) air filter and place in a closed container for proper disposal. Take care not to raise dust. Use non-sparking tools.

Waste Disposal Method

Dispose of in accordance with local, state and federal regulations.

Hazard Label Information

- Store in cool, dry place.
- Wash thoroughly after handling.
- Store in tightly sealed container.

Precautions to be Taken in Handling

Store away from acids, caustics, oxidizing agents and other incompatibilities. Chromium carbide reacts with moisture to form methane gas. Handle and store in a controlled environment and inert gas such as argon.

Precautions to be Taken in Storing

Keep container closed when not in use. Store in dry, cool place.

Other Precautions

None

SECTION 8 - CONTROL MEASURES

Protective Equipment Summary - Hazard Label Information:

NIOSH approved respirator Impervious gloves Safety glasses Clothes to prevent skin contact

Respiratory Equipment (Specify Type)

NIOSH - approved dust, mist, vapor cartridge respirator

Eye Protection

Safety glasses

Protective Gloves

Butyl, CPE, PVC

Other Protective Clothing

Protective gear suitable to prevent contamination

Ventilation

Local Exhaust: Local exhaust ventilation may be necessary to control any air contaminants to within their PELs or TLVs during the use of this product.

Special: None

Mechanical (Gen): Not recommended

Other: Handle in an inert gas such as argon

Work/Hygienic/Maintenance Practices

Implement engineering and work practice controls to reduce and maintain concentration of exposure at low levels. Use good housekeeping and sanitation practices. Do not use tobacco or food in work area. Wash thoroughly before eating and smoking. Do not blow dust off clothing or skin with compressed air.

SECTION 9 – OTHER

Control of Substances Hazardous to Health Regulations
EH40 Occupational Exposure Limits

Maximum Exposure Limit: NE

Occupational Exposure Standard: NE

HAI Advanced Material Specialists, Inc. requests the users of this product to study this Material Safety Data Sheet (MSDS) and become aware of product hazards and safety information. To promote safe use of this product, a user should (1) notify its employees, agents, and contractors of the information on this MSDS and any product hazard and safety information, (2) furnish this same information to each of its customers for the product, and (3) request such customers to notify their employees and customers for the product of the product hazards and safety information.

Company Policy or Disclaimer

The above information is accurate to the best of our knowledge. However, since data, safety standards, and government regulations are subject to change, and the conditions of handling and use or misuse are beyond our control, HAI MAKES NO WARRANTY, EITHER EXPRESSED NOR IMPLIED, WITH RESPECT TO THE COMPLETENESS OR CONTINUING ACCURACY OF THE INFORMATION CONTAINED HEREIN, AND DISCLAIMS ALL LIABILITY FOR RELIANCE THEREON. Users should satisfy themselves that they have all current data relevant to their particular use.

Abbreviations used: N/A=Not Applicable NE: Not Established