

## MATERIAL SAFETY DATA SHEET

### SECTION 1 – PRODUCT IDENTIFICATION

Product Name: **Alloy C Powder**  
Product Item: 257273  
Product Code: HA 7591

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

Emergency Contact: 888-255-3924  
Chemical Family: Alloy C  
Formula: Ni 16Cr 17Mo (Alloy C)  
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 *
Carbon	7440-44-0	0.048	2.5	2.0	
Chromium	7440-47-3	16.418	0.5	0.5	
Cobalt	7440-48-4	0.090	0.05	0.02	
Iron	1309-50-8	6.274	None	None	
Maganese	7439-96-5	0.674	5.0CL/1.0 Fume	Dust 5.0/ Fume 1.0	
Molybdenum	7439-98-7	16.805	10.0	10.0	
Nickel	7440-02-0	BAL.	1.0	1.0	
Silicon	7440-21-3	0.660	10.0	Dust 10.0	
Vanadium	7440-62-2	0.292	Dust 0.5/Fume .1	.05 as V <sub>2</sub> O <sub>5</sub> Dust & Fume	
Tungsten	7440-33-7	4.625	5.0	5.0	

### SECTION 3 – PHYSICAL/CHEMICAL CHARACTERISTICS

Physical States:  Gas  Liquid  Solid  
Melting Point: >2440°F  
Boiling Point: No data  
Specific gravity (water=1): 8.88  
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: Grey powder, no odor  
Other: None

#### SECTION 4 – FIRE AND EXPLOSION HAZARD DATA

Flash point: N/A Method Used: Unknown  
Auto ignition temp.: N/A  
Flammable limits: N/A  
Explosive Limits: LEL: N/A UEL: N/A  
Extinguishing Media: Use special dry powder extinguishing material such as dry sand or limestone 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. May emit toxic fumes if involved in fire.

#### SECTION 5 – REACTIVITY DATA

Stability: Unstable [ ] Stable [ X ]  
Conditions to avoid - Instability: Accumulation of fine powder, below 1µm  
Incompatibility - Materials to avoid: Acids, can produce flammable hydrogen gas  
Hazardous decomposition products: Fumes of cobalt  
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, neoplastic, tumorigenic and teratogenic data. Poison by ingestion, intratracheal, intraperitoneal, subcutaneous and intravenous routes. An experimental teratogenic. 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)

Iron: Is of varying toxicity. Exposure to iron oxides is potentially a serious risk in all industrial settings. Some iron compounds are suspected carcinogens. In general, ferrous compounds are more toxic than ferric compounds. Acute exposure to excessive levels of ferrous compounds can cause liver and kidney damage, altered respiratory rates, and convulsions. (Sax, Dangerous Properties of Industrial Materials, eighth edition)

Molybdenum compounds are poison by subcutaneous and intraperitoneal routes. Molybdenum and its compounds are highly toxic based upon animal experiments. Symptoms of acute poisoning include severe gastrointestinal irritation with diarrhea, coma and deaths from heart failure. Experimental animals exposed to high levels accumulated Mo in the lungs, spleen, and heart, and showed a decrease of DNA and RNA in the liver, kidneys and spleen. (Sax, Dangerous Properties of Industrial Materials, eighth edition)

Cobalt has a low toxicity by ingestion. Ingestion of soluble salts, produces nausea and vomiting by local irritation. In animals, administration of cobalt salts produces an increase in the total red cell mass of the blood. In humans, a single case of poisoning with liver and kidney damage has been attributed to cobalt. Locally, cobalt has been shown to produce dermatitis and investigators have been able to demonstrate a hypersensitivity of the skin to cobalt. There have been reports of hematologic, digestive and pulmonary changes in humans. (Sax, Dangerous Properties of Industrial Materials, eighth edition)

Inhalation: Acute: May be toxic by inhalation. May cause irritation to the mucous membranes, upper respiratory tract, coughing, dyspnea, soreness in the chest, weight loss, hemoptysis, bronchitis, asthma, pulmonary fibrosis and radiological changes in the lungs.

Chronic: May cause permanent respiratory disease, occupational asthma and interstitial fibrosis.

Ingestion: Acute: Poison by ingestion. May cause irritation to the gastrointestinal tract, diarrhea and acute cobalt poisoning.

Chronic: No chronic health effects recorded.

Skin: Acute: May cause irritation.

Chronic: May cause allergic sensitization, eczema and dermatitis.

Eye: Acute: May cause irritation.

Chronic: May cause conjunctivitis.

Target Organs: May affect the respiratory and skin

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

**Carcinogenicity / other Information:**

Cobalt:

IARC 2B: Possibly Carcinogenic to Humans. The exposure circumstances entails exposures that are possibly carcinogenic to humans. This category is used for agents, mixtures, and exposure circumstances for which there is limited evidence of carcinogenicity in humans and less than sufficient evidence of carcinogenicity in experimental animals. It may also be used when there is inadequate evidence of carcinogenicity in humans but there is sufficient evidence of carcinogenicity in experimental animals. In some instances, an agent, mixture, or exposure circumstance for which there is inadequate evidence of carcinogenicity in humans but limited evidence of carcinogenicity in experimental animals together with supporting evidence from other relevant data may be placed in the group.

ACGIH-TLV A3: Confirmed Animal Carcinogen with unknown relevance to humans: The agent is carcinogenic in experimental animals at a relatively high dose, by route(s) of administration, at site(s), of histological type(s), or by mechanism(s) that may not be relevant to worker exposure. Available epidemiologic studies do not confirm an increased risk of cancer in exposed humans. Available evidence does not suggest that the agent is likely to cause cancer in humans except under uncommon or unlikely routes or levels of exposure.

**Recommended Exposure Limits** See "Section II"

**LD 50 / LC 50**

itr-rat LDLO: 50 mg/kg (85/15 %)

**Signs and Symptoms of Exposure**

Inhalation: May cause a red, dry throat, coughing, sneezing, soreness in the chest, shortness of breath, wheezing, chest tightness and loss of weight.

Ingestion: May cause diarrhea, nausea, vomiting and stomach cramps. Acute cobalt poisoning may cause: nausea, vomiting, headaches, dizziness, diarrhea, lower blood pressure and body temperature.

Skin: May cause allergic dermatitis, redness, itching, burning and inflammation.

Eye: May cause redness, itching, burning, and watering.

**Medical Conditions Generally Aggravated by Exposure**

Pre-existing respiratory 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, wash skin thoroughly with soap and water. If irritation develops, seek medical attention.

Eye: If contact with eye occurs, flush with large amounts of water for at least ten (10) minutes. If irritation continues, seek medical attention.

**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 VIII-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.

**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**

None

**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 respirator

**Eye Protection**

Safety glasses

**Protective Gloves**

Rubber gloves

**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: None

**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