

MATERIAL SAFETY DATA SHEET

SECTION 1 – PRODUCT IDENTIFICATION

Product Name: **Tungsten Carbide Cobalt Chrome (86/10/4) Powder**
 Product Item: 328350
 Product Code: HA 8350

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

Emergency Contact: 888-255-3924
 Chemical Family: Cemented carbide
 Formula: WC, W₂C-Co
 Molecular Weight: 2449.13

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 *
Tungsten Carbide	12070-12-1	0.0-88.0%	5.10 mg/m ³	5.10 mg/m ³	No data
Cobalt	7440-48-4	0.0-12.0%	.05 mg/m ³	.05 mg/m ³	No data
Chrome	7440-47-3	0.0-100.0%	1 mg/m ³	0.5 mg/m ³	NE
Material or Component	RTECS #	OSHA STEL	OSHA CEIL	ACGIH STEL	ACGIH STEL
Tungsten Carbide	NA	No data	No data	10 mg/m ³	No data
Cobalt	GF8750000	No data	No data	No data	No data
Chrome	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)
Tungsten Carbide	12070-12-1	No	No	No
Cobalt	7440-48-4	No	No	Yes
Chrome	7440-47-3	No	Yes 5000 lb	Yes

SECTION 3 – PHYSICAL/CHEMICAL CHARACTERISTICS

Physical States: Gas Liquid Solid
 Melting Point: >1,300°C
 Boiling Point: No data
 Specific gravity (water=1): No data
 Vapor pressure (mmHg): No data

<u>Vapor Density (Air=1):</u>	No data
<u>Evaporation rate (Butylacetate=1):</u>	No data
<u>Solubility in water:</u>	Insoluble
<u>Percent volatile (vol.):</u>	No data
<u>Corrosion Rate:</u>	No data
<u>Appearance and odor:</u>	Dark grey powder, no odor
<u>Other:</u>	None

SECTION 4 – FIRE AND EXPLOSION HAZARD DATA

<u>Flash point:</u>	N/A	Method Used: Unknown
<u>Auto ignition temp.:</u>	N/A	
<u>Flammable limits:</u>	N/A	
<u>Explosive Limits:</u>	LEL: N/A	UEL: N/A
<u>Extinguishing Media:</u>	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.	
<u>Special fire fighting procedures:</u>	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.	
<u>Unusual fire and explosion hazards:</u>	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

<u>Stability:</u>	Unstable []	Stable [X]
<u>Conditions to avoid - Instability:</u>	Accumulation of fine powder, below 1µm	
<u>Incompatibility - Materials to avoid:</u>	Acids, can produce flammable hydrogen gas	
<u>Hazardous decomposition products:</u>	Fumes of cobalt	
<u>Hazardous polymerization:</u>	Will occur []	Will not occur [X]
<u>Conditions to avoid - Hazardous polymerization:</u>	None	
<u>Product corrosive:</u>	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.

Tungsten compounds: Industrially this element does not constitute an important health hazard. Exposure is related chiefly to the dust arising from the crushing and milling of the two chief ores of tungsten, namely, scheelite and wolframite. Heavy exposure to the dust or the large amounts of the soluble compounds produces changes in body weight, behavior, blood cells, choline esterase activity and sperm in experimental animals. (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)

<u>Inhalation:</u>	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