

MSDS#  
MMC 60530000

Date Created: 7/30/01  
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PRODUCT NAME..... All Komet/Dihart/JEL Carbide Grades  
 CHEMICAL NAME..... Tungsten Carbide with Cobalt Binder  
 CHEMICAL FAMILY..... Refractory Metal Carbide  
 SYNONYMS..... Hard Metal, Cemented WC, Tungsten Carbide  
 MOLECULAR WEIGHT..... N/A

**INGREDIENTS**

MATERIAL	%BY WEIGHT	OSHA TLV-TWA (mg/m3)	ACGIH TLV-TWA (mg/m3)	NFPA HAZARD RATING scale 0-4		
				Health	Fire	Reactivity
Tungsten Carbide	30.0-97.7	5	5	No NFPA Rating	0	0
Cobalt	2.0-25.0	0.1	0.1	1	3	0
Tantalum Carbide	0.1-15.0	5	5	No NFPA Rating	0	0
Titanium Carbide	0.1-15.0	5	None Established	No NFPA Rating	0	0
Niobium Carbide	0.1-25.0	5	5	No NFPA Rating	0	0

**PHYSICAL DATA**

DESCRIPTION..... Gray Powder or Solid  
 BOILING POINT..... 2870°C (5198°F)  
 MELTING POINT..... 1495°C (2723°F)  
 SPECIFIC GRAVITY (H<sub>2</sub>O=1)..... 9.5 to 15.5  
 VAPOR DENSITY (AIR=1)..... N/A  
 SOLUBILITY IN WATER..... Practically Insoluble  
 SOLVENT SOLUBILITY..... N/A  
 PERCENT VOLATILES BY VOLUME..... N/A  
 EVAPORATION RATE..... N/A

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## FIRE AND EXPLOSION HAZARD DATA

### Fire and Explosion Hazards:

Finely divided tungsten powder or dust from grinding are expected to be a fire and explosive hazard when exposed to high temperatures or ignition sources. Particle size and dispersion in air determine reactivity. Tungsten carbide product, except as powder or dust, is not a fire hazard.

### Flash Point:

N/A

### Firefighting Method:

For localized powder fire, smother with dry sand, dry dolomite, sodium chloride or soda ash.

### Special Firefighting Procedures:

Move container from fire area if possible. Cool containers exposed to flame with water from side until well after fire is out. For massive fire in cargo area, use unmanned hose holder or monitor nozzles; else withdraw and let fire burn.

Use soda ash, powdered sodium chloride, or suitable dry powder.

Avoid breathing fumes from burning material.

Firefighting personnel use proper respiratory protection.

## REACTIVITY

### Stability:

Stable under normal temperatures and pressure.

### Incompatibilities:

Tungsten Carbide with: Chlorine Trifluoride - Reacts with flame.

Fluorine – Incandescences.

Nitrogen Dioxide – Burns with incandescence if heated to dull red.

Nitrous Oxide – Burns with incandescence if heated to dull red.

Iodine Pentafluoride – Violent reaction.

Lead Oxide – Violent reaction.

Cobalt with:

Ammonium Nitrate + Metals or Bromide Pentafluoride – Reacts violently and sometimes explosively.

Hydrazinium Nitrate – Decomposes explosively upon rapid heating.

Nitryl Fluoride – Reacts incandescently.

Acetylene – Reacts incandescently.

## Decomposition:

Thermal decomposition may release acrid smoke and irritating fumes.

## Polymerization:

Not known to occur.

## TOXICITY

**WARNING:** Over exposure to this material in the form of metallurgical powder, dust or mist from grinding or sweeping is hazardous to health. This may cause eye, skin, and mucous membrane irritation. Consequently, it may cause temporary or permanent respiratory disease; furthermore, permanent respiratory disease can lead to disability or death. Certain pulmonary and skin conditions may be aggravated by exposure.

Carcinogenic status: None of the components of this material has been identified as known or suspected carcinogens.

Tungsten Carbide: Toxicity has not been quantified. May cause pulmonary and skin sensitization in dust form.

Cobalt: 1500 mg/kg Oral-rat LDLo; 250 mg/kg Intra-peri-toneal-rat LDLo; 100 mg/kg Intravenous-rat LDLo; 20mg/kg Oral-rabbit LDLo; 100 mg/kg Intravenous rabbit LDLo.

Tantalum Carbide, Titanium Carbide, and Niobium Carbide: May cause mucous membrane irritation.

## HEALTH EFFECTS AND FIRST AID

**INHALATION:**

Irritant/Sensitizer: 20 mg. (CO)/m<sup>3</sup> is immediately dangerous to life and health. Inhalation may cause irritation of the nose and throat.

**Acute Overexposure:**

Tungsten Carbide: May cause coughing, dyspnea, soreness in the chest, weight loss, hemoptysis, bronchitis, and asthma. Also, may cause pulmonary fibrosis and radiological changes may be noticed in the lungs.

Cobalt: May cause shortness of breath, asthma, dyspnea on exertion, wheezing, interstitial pneumonitis, and/or lung densities.

Tantalum Carbide: None reported in humans.

Titanium Carbide: May be considered a nuisance dust and may result in dust accumulation in the lungs.

Niobium Carbide: May cause respiratory irritation.

**Chronic Overexposure:**

Tungsten Carbide: May cause "hard metal lung" with symptoms as described in acute exposure. Previously exposed individuals may be at an increased risk.

Cobalt: May cause pneumoconiosis, sensitization of the respiratory tract, obstructed airways syndrome, interstitial lung disease and density of the lung with symptoms as described in acute exposure.

Tantalum Carbide: None reported in humans. This has been demonstrated to be physiologically inert in animals.

Titanium Carbide: May cause fibrosis or pneumoconiosis.

Niobium Carbide: None reported in humans.

**First Aid:**

If symptoms of pulmonary involvement develop (coughing, wheezing, shortness of breath), remove from exposure area to fresh air immediately. If breathing has stopped, perform artificial respiration. Keep affected person warm and at rest. Get medical attention immediately!

**SKIN CONTACT:**

Irritant/Sensitizer:

**Acute Overexposure:**

Tungsten Carbide: May cause irritation with dermatitis, eczema, and itching. May also cause sensitization dermatitis if previously exposed.

Cobalt: Sensitization dermatitis may occur in persons who are previously exposed. A rash may develop, usually in the flexor areas of the elbow, neck, and face.

Tantalum Carbide, Titanium Carbide, Niobium Carbide: None reported in humans.

### Chronic Overexposure:

Tungsten Carbide: May cause contact dermatitis.

Cobalt: May cause contact dermatitis. Sensitization dermatitis may follow inhalation or prolonged contact.

Tantalum Carbide, Titanium Carbide, Niobium Carbide: None reported in humans.

### First Aid:

If irritation or rash occurs, remove contaminated clothing and shoes immediately. Wash affected area with soap or mild detergent and large amounts of water until no evidence of material remains (approximately 15-20 minutes). Get medical attention.

### EYE CONTACT:

Irritant.

### Acute Overexposure:

Tungsten Carbide: May cause irritation with redness, pain, and itching.

Cobalt: May cause irritation with redness, pain, and itching.

Tantalum Carbide, Titanium Carbide, Niobium Carbide: May cause irritation.

### Chronic Overexposure:

Tungsten Carbide, Cobalt, Tantalum Carbide, Niobium Carbide: May cause conjunctivitis.

### First Aid:

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If irritation occurs, wash eyes immediately with large amounts of water, occasionally lifting upper and lower lids, until no evidence of material remains (approximately 15-20 minutes). Get medical attention immediately.

**Ingestion:**

Irritant.

**Acute Overexposure:**

Tungsten Carbide: May cause gastrointestinal irritation. Large doses may cause diarrhea.

Cobalt: May cause hypotension, pain, vomiting, nerve deafness, and sensations of hotness and nausea. Severe exposure may cause pericardial effusion, convulsions, or enlargement of the thyroid.

Tantalum Carbide, Titanium Carbide, Niobium Carbide: Systemic poisoning not known to occur.

**Chronic Overexposure:**

Tungsten Carbide: None reported in humans.

Cobalt: May adversely affect the pancreas, thyroid gland, heart, or bone marrow.

Tantalum Carbide, Titanium Carbide, Niobium Carbide: None reported in humans.

**First Aid:**

If this material has been swallowed and person is conscious, immediately give person large amounts of water. After water has been swallowed, induce vomiting. Do not attempt to make an unconscious person vomit. Get medical attention immediately.

**SPILL OR LEAK PROCEDURES****Steps to be taken in case material is released or spilled:**

Ventilate area of spill. Clean up using methods, which avoid dust, generation such as vacuum (with appropriate filter to prevent airborne dust levels, which exceed OSHA permissible exposure levels) wet dust mop or wet clean-up. If airborne is generated, use an appropriate NIOSH approved respirator.

**Waste Disposal Method:**

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This is a valuable material that should be sent to an appropriate reclamation facility if available. If material cannot be sent to a reclamation facility, disposal should be made in compliance with federal, state and local environmental regulations.

## **CONTROL MEASURES AND PROTECTIVE EQUIPMENT**

### **Ventilation:**

Use local exhaust ventilation adequate to limit personal exposure to respirable airborne dust levels that do not exceed OSHA permissible limits. If such equipment is not available use respirators as specified below.

### **Respiratory Protection:**

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|----------------------------|--|
| 0.5mg(CO)/m <sup>3</sup> – | Dust mask, except single-use respirator.   |
| 1 mg(CO)/m <sup>3</sup> –  | Dust mask, except single-use and quarter-mask respirators. Fume or high-efficiency particulate respirator.   |
| 5 mg(CO)/m <sup>3</sup> –  | High-efficiency particulate respirator with full facepiece. Supplied-air respirator with full facepiece, helmet or hood. Self-contained breathing apparatus with full facepiece.                       |
| 20mg(CO)/m <sup>3</sup> –  | Powered air-purifying respirator with high-efficiency filter with a full facepiece Type “C” supplied-air respirator with a full facepiece operated in pressure demand or other positive-pressure mode. |

### **Firefighting:**

Self-contained breathing apparatus with a full facepiece operated in pressure-demand or other positive-pressure mode.

### **Clothing:**

Employees must wear appropriate protective clothing and equipment to prevent repeated or prolonged skin contact with this substance. Soiled clothing should be laundered separately.

### **Protective Gloves:**

Protective gloves or barrier cream are recommended when contact with dust or mist is likely. Wash thoroughly before applying the barrier cream or use of protective gloves.

### **Eye Protection:**

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Safety glasses with side shields or goggles are recommended. Where there is any possibility that an employee's eyes may be exposed to this substance, the employer should provide an eyewash fountain within the immediate work area for emergency use.

## **SPECIAL PRECAUTIONS**

### **Handling and Storage:**

Avoid dispersion of dust in air. Finely divided particles, dust, or fumes may be flammable or explosive. Keep away from sparks and ignition sources. Contents should be stored in a clean, dry cool area.

### **Other Precautions:**

Wash hands thoroughly after handling, then before eating or smoking. Do not shake clothing, rags or other items to remove dust. Remove dust by washing or vacuuming.

Periodic medical examinations are recommended for individuals regularly exposed to dust or mist.

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