

MATERIAL SAFETY DATA SHEET

BEGIN MSDS 00224277

SECTION 1 CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

SUBSTANCE: CTC

TRADE NAMES/SYNONYMS:

**CEMENTED TUNGSTEN CARBIDE; CEMENTED CARBIDE PRODUCT WITH COBALT/NICKEL BINDER;
00224277**

CREATION DATE: Nov 19 1999

REVISION DATE: Dec 09 2004, Mar 16 2006, Dec 07 2006

SECTION 2 COMPOSITION, INFORMATION ON INGREDIENTS

COMPONENT: TUNGSTEN CARBIDE

CAS NUMBER: 12070-12-1

EC NUMBER (EINECS): 235-123-0

PERCENTAGE: 60-96

COMPONENT: COBALT

CAS NUMBER: 7440-48-4

EC NUMBER (EINECS): 231-158-0

PERCENTAGE: 0-30

COMPONENT: NICKEL

CAS NUMBER: 7440-02-0

EC NUMBER (EINECS): 231-111-4

PERCENTAGE: 0-20

COMPONENT: TITANIUM CARBIDE

CAS NUMBER: 12070-08-5

EC NUMBER (EINECS): 235-120-4

PERCENTAGE: 0-15



COMPONENT: TANTALUM CARBIDE
CAS NUMBER: 12070-06-3
EC NUMBER (EINECS): 235-118-3
PERCENTAGE: 0-15

COMPONENT: TITANIUM CARBO-NITRIDE
CAS NUMBER: 12627-33-7
EC NUMBER: Not assigned.
PERCENTAGE: 0-10

COMPONENT: NICKEL CARBIDE
CAS NUMBER: 12710-36-0
EC NUMBER: Not assigned.
PERCENTAGE: 0-10

COMPONENT: CHROMIUM CARBIDE
CAS NUMBER: 12012-35-0
EC NUMBER (EINECS): 234-576-1
PERCENTAGE: 0-5

COMPONENT: VANADIUM CARBIDE
CAS NUMBER: 12070-10-9
EC NUMBER (EINECS): 235-122-5
PERCENTAGE: 0-5

SECTION 3 HAZARDS IDENTIFICATION

NFPA RATINGS (SCALE 0-4): HEALTH=2 FIRE=3 REACTIVITY=0

EMERGENCY OVERVIEW:

PHYSICAL FORM: solid

MAJOR HEALTH HAZARDS: respiratory tract irritation, skin irritation, eye irritation, allergic reactions, cancer hazard (in humans)

PHYSICAL HAZARDS: Negligible fire and explosion hazard in bulk form. Dust/air mixtures may ignite or explode.

POTENTIAL HEALTH EFFECTS:

INHALATION:

SHORT TERM EXPOSURE: irritation, allergic reactions, fever, nausea, difficulty breathing, asthma, headache, dizziness, blindness, lung



congestion, lung damage

LONG TERM EXPOSURE: irritation, allergic reactions, lack of sense of smell, changes in blood pressure, nausea, vomiting, loss of appetite, weight loss, chest pain, difficulty breathing, wheezing, asthma, irregular heartbeat, headache,

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sleep disturbances, emotional disturbances, pain in extremities, hearing loss, lung damage, blood disorders, heart disorders, kidney damage, liver damage, paralysis, reproductive effects, effects on the brain, cancer

SKIN CONTACT:

SHORT TERM EXPOSURE: irritation, allergic reactions, skin disorders, itching

LONG TERM EXPOSURE: same as effects reported in short term exposure, skin disorders

EYE CONTACT:

SHORT TERM EXPOSURE: irritation, tearing

LONG TERM EXPOSURE: irritation

INGESTION:

SHORT TERM EXPOSURE: irritation, metallic taste, nausea, vomiting, digestive disorders, diarrhea, stomach pain, difficulty breathing, headache, dizziness, convulsions

LONG TERM EXPOSURE: irritation, rash, changes in blood pressure, ringing in the ears, nausea, vomiting, diarrhea, stomach pain, difficulty breathing, irregular heartbeat, disorientation, hearing loss, bluish skin color, blood disorders, heart disorders, nerve damage

CARCINOGEN STATUS:

OSHA: No

NTP: Yes

IARC: Yes

SECTION 4 FIRST AID MEASURES

INHALATION: If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. Get immediate medical attention.

SKIN CONTACT: Wash skin with soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention, if needed. Thoroughly clean and dry contaminated clothing and shoes before reuse.

EYE CONTACT: Flush eyes with plenty of water for at least 15 minutes. Then get immediate medical attention.

INGESTION: If a large amount is swallowed, get medical attention.

SECTION 5 FIRE FIGHTING MEASURES

FIRE AND EXPLOSION HAZARDS: Negligible fire and explosion hazard in bulk form.
Dust/air mixtures may ignite or explode.

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EXTINGUISHING MEDIA: dolomite, dry powder for metal fires, dry sand, graphite,
soda ash, sodium chloride

Do not get water directly on material.

FIRE FIGHTING: Move container from fire area if it can be done without risk.
Cool containers with water spray until well after the fire is out. Stay away
from the ends of tanks. For fires in cargo or storage area: Cool containers
with water from unmanned hose holder or monitor nozzles until well after
fire is out. If this is impossible then take the following precautions: Keep
unnecessary people away, isolate hazard area and deny entry. Let the fire
burn. Use extinguishing agents appropriate for surrounding fire. Avoid
inhalation of material or combustion by-products.

SECTION 6 ACCIDENTAL RELEASE MEASURES

WATER RELEASE:

Subject to California Safe Drinking Water and Toxic Enforcement Act of 1986
(Proposition 65). Keep out of water supplies and sewers.

OCCUPATIONAL RELEASE:

Avoid heat, flames, sparks and other sources of ignition. Do not touch spilled
material. Small spills: Collect spilled material in appropriate container for
disposal. Move containers away from spill to a safe area. Large spills: Wet
down area with water. Dike for later disposal. Remove sources of ignition.
Keep unnecessary people away, isolate hazard area and deny entry. Notify Local
Emergency Planning Committee and State Emergency Response Commission for
release greater than or equal to RQ (U.S. SARA Section 304). If release occurs
in the U.S. and is reportable under CERCLA Section 103, notify the National
Response Center at (800)424-8802 (USA) or (202)426-2675 (USA).

SECTION 7 HANDLING AND STORAGE

STORAGE: Store and handle in accordance with all current regulations and standards. Avoid generating dust. See original container for storage recommendations. Keep separated from incompatible substances.

HANDLING: Use methods to minimize dust.

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SECTION 8 EXPOSURE CONTROLS, PERSONAL PROTECTION

EXPOSURE LIMITS:

TUNGSTEN CARBIDE:

TUNGSTEN AND INSOLUBLE COMPOUNDS (as W):

- 5 mg/m³ OSHA TWA (vacated by 58 FR 35338, June 30, 1993)
- 10 mg/m³ OSHA STEL (vacated by 58 FR 35338, June 30, 1993)
- 5 mg/m³ ACGIH TWA
- 10 mg/m³ ACGIH STEL
- 5 mg/m³ NIOSH recommended TWA 10 hour(s)
- 10 mg/m³ NIOSH recommended STEL

NICKEL:

NICKEL, METAL AND INSOLUBLE COMPOUNDS (as Ni):

- 1 mg/m³ OSHA TWA
- 1.5 mg/m³ ACGIH TWA (inhalable fraction) (metal)
- 0.2 mg/m³ ACGIH TWA (inhalable fraction) (insoluble compounds)
- 0.015 mg/m³ NIOSH recommended TWA 10 hour(s)

COBALT:

COBALT METAL, DUST, AND FUME (as Co):

- 0.1 mg/m³ OSHA TWA
- 0.05 mg/m³ OSHA TWA (vacated by 58 FR 35338, June 30, 1993)
- 0.02 mg/m³ ACGIH TWA
- 0.05 mg/m³ NIOSH recommended TWA 10 hour(s)

TANTALUM CARBIDE:

TANTALUM METAL AND OXIDE DUSTS (as Ta):



5 mg/m³ OSHA TWA
5 mg/m³ ACGIH TWA
5 mg/m³ NIOSH recommended TWA 10 hour(s)
10 mg/m³ NIOSH recommended STEL

NICKEL CARBIDE:

NICKEL, SOLUBLE COMPOUNDS (as Ni):

1 mg/m³ OSHA TWA
0.1 mg/m³ OSHA TWA (vacated by 58 FR 35338, June 30, 1993)
0.1 mg/m³ ACGIH TWA (inhalable fraction)
0.015 mg/m³ NIOSH recommended TWA 10 hour(s)

CHROMIUM CARBIDE:

CHROMIUM, CHROMIC AND CHROMOUS COMPOUNDS (as Cr):

0.5 mg/m³ OSHA TWA (soluble salts) (chromium (II) compounds) (chromium (III) compounds)

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1 mg(Cr)/m³ OSHA TWA (insoluble salts)
2.5 ug(Cr (VI))/m³ OSHA action level 8 hour(s) (hexavalent chromium compounds)
5 ug(Cr (VI))/m³ OSHA action PEL 8 hour(s) (hexavalent chromium compounds)
0.5 mg/m³ ACGIH TWA (chromium (III) compounds)
0.5 mg/m³ NIOSH recommended TWA 8 hour(s) (chromium (II) compounds)
(chromium (III) compounds)

VANADIUM CARBIDE:

1 mg/m³ NIOSH recommended TWA 10 hour(s)
3 mg/m³ NIOSH recommended STEL

VENTILATION: Ventilation equipment should be explosion-resistant if explosive concentrations of material are present. Provide local exhaust ventilation system. Ensure compliance with applicable exposure limits.

EYE PROTECTION: Wear splash resistant safety goggles with a faceshield. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

CLOTHING: Wear appropriate chemical resistant clothing.

GLOVES: Wear appropriate chemical resistant gloves.

RESPIRATOR: Under conditions of frequent use or heavy exposure, respiratory protection may be needed. Respiratory protection is ranked in order from minimum to maximum. Consider warning properties before use.
Any dust, mist, and fume respirator.
Any air-purifying respirator with a high-efficiency particulate filter.
Any powered, air-purifying respirator with a dust, mist, and fume filter.
Any powered, air-purifying respirator with a high-efficiency particulate filter.

For Unknown Concentrations or Immediately Dangerous to Life or Health -
Any supplied-air respirator with full facepiece and operated in a
pressure-demand or other positive-pressure mode in combination with a
separate escape supply.
Any self-contained breathing apparatus with a full facepiece.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE: solid
ODOR: Not available
BOILING POINT: Not applicable
MELTING POINT: Not available
VAPOR PRESSURE: Not applicable
VAPOR DENSITY: Not applicable

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SPECIFIC GRAVITY: Not available
WATER SOLUBILITY: Not available
PH: Not applicable
VOLATILITY: Not applicable
ODOR THRESHOLD: Not available
EVAPORATION RATE: Not applicable
COEFFICIENT OF WATER/OIL DISTRIBUTION: Not available

SECTION 10 STABILITY AND REACTIVITY

REACTIVITY: Stable at normal temperatures and pressure.

CONDITIONS TO AVOID: Avoid generating dust. Avoid heat, flames, sparks and other sources of ignition.

INCOMPATIBILITIES: No data available.

HAZARDOUS DECOMPOSITION:

Thermal decomposition products: miscellaneous decomposition products

POLYMERIZATION: Will not polymerize.



SECTION 11 TOXICOLOGICAL INFORMATION

TUNGSTEN CARBIDE:

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: respiratory disorders

MUTAGENIC DATA: Available.

COBALT:

TOXICITY DATA: 6171 mg/kg oral-rat LD50

CARCINOGEN STATUS: IARC: Human Inadequate Evidence, Animal Sufficient Evidence, Group 2B; ACGIH: A3 -Animal Carcinogen (Cobalt and cobalt compounds)

LOCAL EFFECTS: Irritant: inhalation, skin, eye

ACUTE TOXICITY LEVEL:

Slightly Toxic: ingestion

TARGET ORGANS: immune system (sensitizer)

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: respiratory disorders, skin disorders and allergies

TUMORIGENIC DATA: Available.

MUTAGENIC DATA: Available.

ADDITIONAL DATA: Alcohol may enhance the toxic effects.

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NICKEL:

CARCINOGEN STATUS: NTP: Anticipated Human Carcinogen; IARC: Human Inadequate Evidence, Animal Sufficient Evidence, Group 2B (Nickel); ACGIH: A5 -Not

Suspected as a Human Carcinogen metal

LOCAL EFFECTS: Irritant: inhalation, skin

TARGET ORGANS: immune system (sensitizer)

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: immune system disorders or allergies, respiratory disorders, skin disorders and allergies.

TUMORIGENIC DATA: Available.

MUTAGENIC DATA: Available.

REPRODUCTIVE EFFECTS DATA: Available.

TITANIUM CARBIDE:

ADDITIONAL DATA: May cross the placenta.

NICKEL CARBIDE:

CARCINOGEN STATUS: IARC: Human Sufficient Evidence, Animal Sufficient

Evidence, Group 1 (Nickel and nickel compounds); ACGIH: A4 -Not Classifiable as a Human Carcinogen soluble compounds; EC: Category 1

TARGET ORGANS: immune system (sensitizer)

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: immune system disorders or

allergies, respiratory disorders, skin disorders and allergies

ADDITIONAL DATA: May cross the placenta. May be excreted in breast milk.

CHROMIUM CARBIDE:

CARCINOGEN STATUS: IARC: Human Inadequate Evidence, Animal Inadequate Evidence, Group 3 (Trivalent chromium compounds); ACGIH: A4 -Not Classifiable as a Human Carcinogen (Trivalent chromium compounds)

ADDITIONAL DATA: May cross the placenta. May be excreted in breast milk.

VANADIUM CARBIDE:

LOCAL EFFECTS: Irritant: inhalation, skin, eye

SECTION 12 ECOLOGICAL INFORMATION

Not available

SECTION 13 DISPOSAL CONSIDERATIONS

Dispose in accordance with all applicable regulations.

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SECTION 14 TRANSPORT INFORMATION

U.S. DEPARTMENT OF TRANSPORTATION: No classification assigned.

SECTION 15 REGULATORY INFORMATION



U.S. REGULATIONS:

CERCLA SECTIONS 102a/103 HAZARDOUS SUBSTANCES (40 CFR 302.4):

NICKEL: 100 LBS RQ

SARA TITLE III SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355.30):

Not regulated.

SARA TITLE III SECTION 304 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355.40):

Not regulated.

SARA TITLE III SARA SECTIONS 311/312 HAZARDOUS CATEGORIES (40 CFR 370.21):

ACUTE: Yes

CHRONIC: Yes

FIRE: Yes

REACTIVE: No

SUDDEN RELEASE: No

SARA TITLE III SECTION 313 (40 CFR 372.65):

NICKEL

Cobalt

NICKEL, SOLUBLE COMPOUNDS (as Ni)

CHROMIUM, CHROMIC AND CHROMOUS COMPOUNDS (as Cr)

VANADIUM COMPOUNDS

OSHA PROCESS SAFETY (29CFR1910.119): Not regulated.

STATE REGULATIONS:

California Proposition 65:

Known to the state of California to cause the following:

NICKEL

Cancer (Oct 01, 1989)

NICKEL (refinery dust from the pyrometallurgical process)

Cancer (Oct 01, 1987)

Cobalt

Cancer (Jul 01, 1992)

NICKEL, SOLUBLE COMPOUNDS (as Ni)

Cancer (Oct 01, 1989)

EUROPEAN REGULATIONS:

EC CLASSIFICATION (CALCULATED): Not determined.

NATIONAL INVENTORY STATUS:

U.S. INVENTORY (TSCA): Not listed on inventory.

TSCA 12(b) EXPORT NOTIFICATION: Not listed.



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SECTION 16 OTHER INFORMATION

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