

MATERIAL SAFETY DATA SHEET

HANNIBAL CARBIDE TOOL, INC.

SECTION 1: PRODUCT IDENTIFICATION

Product Name	All Hannibal Carbide Tool, Inc. reamers, drills, counter-bores, end mills, cutters, & single point tools.
Product Description	Cutting tools manufactured with (1) Cemented tungsten carbide with cobalt binder (2) Steel or carbide bodies (3) Braze material on steel-bodied tools (4) Tools with PVD coatings.
Product Use	For cutting metal, plastic, wood, or other materials.
Manufacturer	Hannibal Carbide Tool, Inc. 5000 Paris Gravel Road (P.O. Box 954) Hannibal, MO 63401 (573) 221-2775
Date of MSDS Issue	September, 2011 Form Number F3-0.10 (supersedes September 2004)

SECTION 2: COMPOSITION/INFORMATION ON INGREDIENTS

Material * (CAS #)	% by weight*	OSHA PEL-TWA** (mg/m ³)	ACGIH TLV-TWA ** (mg/m ³)
Carbide components			
Aluminum Titanium Nitride [AlTiN] (148793-50-4)	0-0.5	15	10
Chromium III (7440-47-3)	0-4.5	1	0.5
Chromium Carbide (12012-35-0)	0-5.1	1	0.5
Cobalt (7440-48-4)	1.5-30	0.1	0.02
Hafnium Carbide (12069-85-1)	0-5	0.5	0.5
Molybdenum Carbide (12069-89-5)	0-15	15	10
Nickel (7440-02-0)	0-20	1 insoluble / 1 soluble	1 insoluble / 0.1 soluble
Niobium Carbide (12069-94-2)(12011-99-3)	0-5	15	10
Tantalum Carbide (12070-06-3)	0-56.4	15	10
Titanium Carbide (12070-08-5)	0-20	15	10
Titanium Carbonitride [TiCN] (12654-86-3)	0-0.5	---	10
Titanium Nitride [TiN] (25583-20-4)	0-0.5	15	10
Tungsten Carbide (12070-12-1)	30-98.5	15 insoluble / 1 soluble	10 insoluble / 1 soluble
Vanadium Carbide (11130-21-5)(12070-10-9)	0-10	15	10
Zirconium Nitride [ZrN] (25658-42-8)	0-0.5	5	5
Steel components			
Aluminum (7429-90-5)	0-5	15 dust / 5 respirable fraction	10 dust / 5 welding fume
Carbon (1333-86-4)(7440-44-0)	0-4	3.5 as carbon black	3.5 as carbon black
Chromium (7440-47-3)	0-17	1	0.5
Cobalt (7440-48-4)	0-15	0.1 as cobalt and fume	0.05 as fume
Copper (7440-50-8)	0-1.5	1 dust / 0.1 fume	1 dust / 0.2 fume
Iron (1309-37-1) (7439-89-6)	0-99	10 as iron oxide fume	5 as iron oxide fume
Lead (7439-92-1)	0.10-0.35	0.05 as fume and dust	0.15 as dust and fume
Manganese (7439-96-5)	0-3	5 dust / 1 fume	5 dust / 1 fume
Molybdenum (7439-98-7)	0-11	15 insoluble / 5 soluble	10 insoluble / 5 soluble
Nickel (7440-02-0)	0-18	1 insoluble / 1 soluble	1 insoluble / 0.1 soluble
Niobium (Columbium) (7440-03-1)	0-0.1	15 dust / 5 respirable fraction	10 dust / 3 respirable fraction
Phosphorous (7723-14-0)	0-0.15	0.1	0.1
Selenium (7782-49-2)	0-2	0.2	0.2
Silicon (7440-21-3)	0-5	15 dust / 5 respirable fraction	10 dust / 5 respirable dust
Sulfur (7446-09-5)(7704-34-9)(was 7446-09-05)	0-0.35	13 as sulfur dioxide	5 as sulfur dioxide
Titanium (7440-32-6)	0-0.1	15 dust	10 dust
Tungsten (7440-33-7)	0-20	15 total dust / 5 respirable dust (insoluble compounds)	5 total dust / 10 respirable dust (STEL) (insoluble compounds)
Vanadium (1314-62-1)(7440-62-2)	0-18	0.5 respirable dust / 0.1 fume	0.05 dust / 0.05 fume respirable fraction

Brazing material components			
Copper (7440-50-8)	20-40	1 dust / 0.1 fume	1 dust / 0.2 fume
Nickel (7440-02-0)	1-5	1 insoluble / 1 soluble	1 insoluble / 0.1 soluble
Silver (7440-22-4)	40-54	0.01 metal & soluble	0.1 metal / 0.01 soluble
Zinc (As Oxide) (1314-13-2)(7440-66-6)	5-28	15 total dust / 5 respirable fraction / 5 fume	10 total dust / 5 fume

* Carbide, steel, and brazing components used in final product may be comprised of some or all of the above materials depending upon design of product. Solid carbide products do not contain steel component. In addition, exact percentages depend on grade of material used and specific supplier.

** All OSHA PEL and ACGIH TLV values are reported as 8-hour Time Weighted Averages (TWAs).

SECTION 3: HAZARD IDENTIFICATION

Emergency Overview

During normal operation and usage, cemented carbide products do not present inhalation, ingestion, or other chemical hazards. However, non-routine operations such as **grinding, cutting, burning, or welding** of such products could release dusts or fumes which may present a health hazard, if the exposure limits described in Section 2 are exceeded.

Inhalation: *Irritant/Sensitizer: 20 mg (CO)/m³ is immediately dangerous to life and health.*

Acute Overexposure: May cause respiratory tract irritation which include wheezing, shortness of breath, and fits of coughing which may produce blood, soreness in the chest, and dust accumulation in the lung. It may also cause weight loss, bronchitis, asthma, and inflammation of or damage to lung tissue.

Chronic Overexposure: May cause build-up of dust in the lungs, allergic respiratory reaction, obstructed airways, and lung damage or disease, with symptoms as described in acute exposure. Previously exposed individuals may be at increased risk.

Skin Contact: *Irritant/Sensitizer: in the form of metallurgical powder, dust, or mist from grinding.*

Acute Overexposure: May cause irritation with inflammation, rash and itching. It may also cause allergic skin reaction if previously exposed. A rash may develop, usually in the flexor areas of the elbow, neck and face.

Chronic Overexposure: May cause inflammation and/or rash (irritant or allergic contact dermatitis).

Eye Contact: *Irritant.*

Acute Overexposure: May cause irritation with redness, pain and itching.

Chronic Overexposure: May cause conjunctivitis.

Ingestion: *Irritant: in the form of metallurgical powder, dust, or mist from grinding.*

Acute Overexposure: May cause abnormally low blood pressure and gastrointestinal irritation with pain, vomiting, and sensations of hotness or nausea. Large doses may cause diarrhea. Severe exposure may cause heart damage, convulsions, or enlargement of the thyroid.

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

SECTION 4: FIRST AID MEASURES

Inhalation

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

Skin Contact

If irritation or rash occurs, remove contaminated clothing and shoes immediately. Wash affected areas with soap or mild detergent and large amounts of water until no evidence of material remains. Get medical attention.

Eye Contact

If irritation occurs, wash eyes immediately with large amounts of water, occasionally lifting upper and lower lids, until no evidence of material remains. Get medical attention immediately.

Ingestion

If this material has been swallowed and person is conscious, immediately give person large amounts of water. Do not attempt to make an unconscious person drink or vomit. Induce vomiting only if specifically instructed by a physician. Get medical attention immediately.

SECTION 5: FIRE FIGHTING MEASURES

Fire and Explosion Hazards

Flash Point: not applicable

Explosive Limits: not applicable

Cemented Carbide Products are not a fire hazard under normal conditions of use. However, under rare conditions, finely divided powder/dust or fumes -- from non-routine operations such as **grinding, cutting, burning, or welding** of such products -- are expected to be a fire and explosion hazard when exposed to high temperatures or ignition sources. Particle size, concentration, dispersion, and ignition source would determine reactivity.

Firefighting Media

For localized dust fires, smother with ABC-type fire extinguisher, dry sand, dry dolomite, sodium chloride, or soda ash or flood with water.

Special Fire Fighting Procedures

Avoid breathing fumes from burning material. Use a NIOSH-approved particulate filter respirator for toxic dusts and fumes.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Steps To Be Taken If Material Is Spilled or Released

Clean up area using methods that avoid dust generation such as a high efficiency particulate air (HEPA) vacuum, wet dust mop, or wet cleanup. Residue should be collected in suitable closed containers for later disposal. Use appropriate personal protective equipment including respiratory protection and gloves. Use a NIOSH-approved particulate filter respirator if airborne concentrations could exceed exposure limits listed in Section 2.

SECTION 7: HANDLING AND STORAGE

Non-routine operations such as **grinding, cutting, burning, or welding** of Cemented Carbide Products could generate dust or fumes which would require special handling procedures, as follows:

Handling and Storage

Minimize free fall of powder and avoid dispersion of dust in air. Do not shake clothing, rags, or other items to remove dust. Dust should be removed by washing or vacuuming. Finely divided particles, dust, or fumes may be flammable or explosive. Keep away from sparks or ignition sources. Contents should be stored in a clean area. See Section 13 for disposal methods.

Cleanup

Clean up area using methods that avoid dust generation such as a high efficiency particulate air (HEPA) vacuum, wet dust mop, or wet cleanup. Residue should be collected in suitable closed containers for later disposal. Use appropriate personal protective equipment including respiratory protection and gloves. Use a National Institute of Occupational Safety and Health (NIOSH)-approved respirator if airborne concentrations could exceed exposure limits listed in Section 2.

Other Precautions

Wash hands thoroughly after handling, and before eating or smoking. Periodic medical monitoring is recommended for individuals regularly exposed to dust or fumes.

SECTION 8: EXPOSURE CONTROLS AND PERSONAL PROTECTION

Non-routine operations such as **grinding, cutting, burning, or welding** of Cemented Carbide Products could generate dust or fumes which would require special handling procedures, as follows:

Ventilation

Provide local (preferable) or general exhaust ventilation to maintain exposure levels below exposure limits listed in Section 2.

Respiratory Protection

Use a NIOSH-approved particulate filter respirator if airborne concentrations could exceed exposure limits listed in Section 2. All appropriate requirements set forth in Federal OSHA Hazards Communications Standard 29 CFR 1910.134 should be met.

Clothing

Use appropriate protective clothing that would prevent repeated or prolonged skin contact with dust particles. Soiled clothing should be laundered separately.

Gloves

Use appropriate protective gloves (leather or rubber) or barrier creams to prevent contact with dust particles.

Eye Protection

Use safety glasses with side shields or dust-proof safety goggles. Contact lenses should not be worn when performing these non-routine operations. Where there is a possibility that the machinist's eyes may be exposed to the particulates, an eyewash fountain within the immediate work area should be provided for emergency use.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Appearance and Odor:	Specific Gravity (H₂O=1): 5-16
Carbide: dark gray solid, odorless	Vapor Pressure: not applicable
Steel: gray-black with metallic luster, odorless	Vapor Density: not applicable
Braze material: metallic wire, rod, strip, odorless	Evaporation Rate: not applicable
Boiling Point:	% Volatile by Volume: not applicable
Carbide: n/a	Solubility in Water: practically insoluble
Steel: n/a	Petroleum-based Solvent Solubility: practically insoluble
Braze material: n/a	
Melting Point:	
Carbide: 1495°C (2723°F)	
Steel: 1315°C (2400°F)	
Braze material: 653°C (1207°F)	

SECTION 10: STABILITY AND REACTIVITY

Stability

Stable under normal temperature and pressure.

Decomposition

Thermal decomposition may release acrid smoke and irritating fumes.

Hazardous Polymerization:

Will Not Occur

Incompatibilities

Tungsten Carbide:

Chlorine Trifluoride: Reacts with a flame.

Fluorine: Reacts incandescently.

Nitrogen Dioxide, Nitrous Dioxide: Burns with incandescence if heated to dull red.

Iodine Pentafluoride, Lead Oxide: Reacts violently.

Cobalt:

Ammonium Nitrate + Metals or Bromine Pentafluoride: Reacts violently and sometimes explosively.

Hydrazinium Nitrate: Decomposes explosively upon rapid heating.

Nitryl Fluoride, Acetylene: Reacts incandescently.

Titanium Carbide:

Acids, Strong Oxidizers, Strong Bases and Moisture: Incompatible.

Tantalum Carbide:

Strong Oxidizers: Serious reactivity hazard.

Niobium Carbide:

Acids, Strong Oxidizers, Strong Bases: Incompatible.

SECTION 11: TOXICOLOGICAL INFORMATION

Cobalt

The International Agency for Research on Cancer (IARC) lists Cobalt and Cobalt compounds as *Category 2B* carcinogens (Possibly Carcinogenic to Humans). Cobalt fumes or dust may cause pulmonary, skin, or eye irritation. Cobalt may be a sensitizing agent for skin and respiratory system. Chronic exposure may affect the heart, pancreas, thyroid gland, or bone marrow.

Nickel

The International Agency for Research on Cancer (IARC) lists metallic nickel and alloys as *Category 2B* carcinogens (Possibly Carcinogenic to Humans).

SECTION 12: ECOLOGICAL INFORMATION

Very limited data available

SECTION 13: DISPOSAL CONSIDERATIONS

If scrap material cannot be sent to a reclamation facility, disposal should be made in compliance with federal, state/provincial, and local environmental regulations.

SECTION 14: TRANSPORTATION INFORMATION

These tool products, in their solid form, are not regulated by DOT, IMO, IATA, or AFI -- Code ZZZ

SECTION 15: REGULATORY INFORMATION

OSHA

The tool products, under normal conditions of use, are not hazardous under the criteria of the Federal OSHA Hazards Communication Standard 29 CFR 1910.1200. However, *dust* or *fumes* generated while **grinding, cutting, burning, or welding** this product may be hazardous as noted in Sections 2 and 3.

TSCA

All product ingredients are classified as existing chemicals in the Chemical Substances Inventory of the *Toxic Substances Control Act* (TSCA) of 1976.

EPCRA/SARA

The following ingredients are listed in the 3/01 *Toxics Release Inventory* (TRI) under Section 313 of the *Emergency Planning and Community Right-to-Know Act* (EPCRA), also known as Title III of the *Superfund Amendments and Reauthorization Act* (SARA) of 1986:

Aluminum (7429-90-5); Chromium/Chromium III (7440-47-3); Cobalt (7440-48-4); Copper (7440-50-8); Lead (7439-92-1); Manganese (7439-96-5); Nickel (7440-02-0); Phosphorous (7723-14-0); Selenium (7782-49-2); Silver (7440-22-4); Vanadium (7440-62-2); and Zinc (7440-66-6).

State of California EPA

Chemicals Known to the State to Cause Cancer or Reproductive Toxicity, 6/02:

Carbon black, Cobalt, Lead, and Nickel: "Warning: This product contains a chemical known to the state of California to cause cancer."

Lead: "Warning: This product contains a chemical known to the state of California to cause birth defects or other reproductive harm."

SECTION 16: OTHER INFORMATION

MSDS Copies

For additional MSDS copies or related information, contact Hannibal Carbide Tool, Inc.'s ISO Administrator at (573) 221-2775 or visit our website at www.hannibalcarbide.com.

User Responsibilities

This Material Safety Data Sheet provides information consistent with recommended applications of these products and anticipated non-routine activities involving the product. It is the user's responsibility to identify and protect against health and safety hazards presented by modification of cemented carbide products after manufacture. Individuals handling cemented carbide products should be informed of all relevant hazards and recommended safety precautions, and should have access to the information contained in this MSDS.

Disclaimer

The information contained herein is based upon data provided by manufacturers and suppliers of raw materials used in the manufacture of cemented carbide products. The information is offered in good faith as accurate and correct as of this MSDS issue date, but no representations, guarantees, or warranties of any kind are made as to its accuracy or completeness, suitability for particular applications, hazards connected with the use of the product, or the results to be obtained from the use thereof. User assumes all risk and liability of any use or handling of any material beyond Hannibal Carbide Tool, Inc.'s control. Variations in methods, conditions, equipment used to store, handle, or process the material, and hazards connected with the use of the product are solely the responsibility of the user and remain at its sole discretion.

When applicable, the products described in this MSDS are considered to be "articles" within the meaning of Title 29 of the Code of Federal Regulations, Section 1910.1200 et seq. This MSDS is intended to be used solely for the purpose of satisfying informational requests made pursuant to that requirement. It is not intended to pre-empt, replace, or expand the terms contained in the Hannibal Carbide Tool, Inc. Conditions of Sale. Compliance with all applicable federal, state, and local laws and regulations remains the responsibility of the user, and the user has the responsibility to provide a safe workplace, to examine all aspects of its operation, and to determine if or where precautions, in addition to those described herein, are required. Hannibal Carbide Tool, Inc. makes no warranties, expressed or implied, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose, except as stated in Hannibal Carbide Tool, Inc.'s limited warranty.