

**SECTION 1**
**COMPANY AND PRODUCT INFORMATION**
**PAGE 1 OF 6**

**Product Name:** All CARBOLOY® or SECO® Drilling, Milling, and Turning Insert Grades and Solid Carbide Drills

**Product Descriptions:** 310, 320, 360, 370, 375, 390, 516, 526, 538, 539, 550, 570, 880, 883, 890, 7109, 370S, 55A, BH30, CK20, CP20, CP200, CP25, CP250, CP30, CP300, CP40, CP50, CP500, CP600, F15M, F20M, F25M, F30M, F40M, GH11, GH13, GH15, GH20, GH25, GH9, GJ11, GJ15, GJ6, GJ9, H13, H15, H20, H25, H30, H40, H45, H7F, HF3, HO31, HX, KX, S10M, S1F, S1G, S2, S25M, S4, S51, S6, S60M, SD10, SD100, SD20, SD25, SD52, SD54, SD70, SU41, T100D, T150M, T15M, T200D, T20M, T250D, T250M, T25M, T300D, T35M, T400D, T60M, TK150, TK1000, TK2000, TP10, TP100, TP1000, TP2000, TP3000 TP15, TP20, TP200, TP2000, TP22, TP30, TP300, TP301, TP35, TP351, TP40, TP400, TP401, TX10, TX100, TX150, TY100, U

**Manufacturer:** Carboloy Inc.  
11177 East Eight Mile Road  
Warren, MI 48089

**Date Prepared:** February 23, 2005

**Emergency Telephone:** CHEMTREC: (800) 424-9300

**Non-Emergency Telephone:** (586) 497-5000

**Non-Emergency Fax:** (586) 497-5362

**NFPA Hazard Rating:** HEALTH 3; FLAMMABILITY 0; REACTIVITY 0.

**SECTION 2**
**COMPOSITION, INFORMATION ON INGREDIENTS**

Material (CAS #)	Percent by Weight	OSHA PEL-TWA	ACGIH TLV-TWA
Tungsten carbide (12070-12-1)	7 - 97*	---	5 mg/m <sup>3</sup> (as W)
Cobalt (7440-48-4)	3 - 25*	0.1 mg/m <sup>3</sup>	0.02 mg/m <sup>3</sup>
Chromium, trivalent (7440-47-3)	2 - 2.5**	0.5 mg/m <sup>3</sup>	0.5 mg/m <sup>3</sup>
Tantalum carbide (12070-06-3)	0 - 56.4*	5 mg/m <sup>3</sup> (as Ta)	5 mg/m <sup>3</sup> (as Ta)
Titanium carbide (12070-08-5)	0 - 12.6*	15 mg/m <sup>3</sup> ***	---
Aluminum oxide (1344-28-1)	0 - 0.5*	15 mg/m <sup>3</sup> ***	10 mg/m <sup>3</sup>
Titanium aluminum nitride (108398-79-4)	0 - 0.5*	15 mg/m <sup>3</sup> ***	---
Titanium nitride (25583-20-4)	0 - 0.5*	15 mg/m <sup>3</sup> ***	---
Titanium carbonitride (12627-33-7)	0 - 0.5*	15 mg/m <sup>3</sup> ***	---
Niobium carbide (12011-99-3)	0 - 4.3*	15 mg/m <sup>3</sup> ***	---

**Notes:**

\* Exact Percentages Depend on Grade Specifications  
 \*\* Grade 7109 only

\*\*\* Permissible Exposure Limit for Nuisance Dust  
 --- Not established

**SECTION 3**
**HAZARDS IDENTIFICATION**
**Emergency Overview:**

During normal operation and usage, cemented carbide products do not present inhalation, ingestion, or other chemical hazards. However, operations such as grinding, cutting, burning, and welding of such products may release dusts, fumes,

**Emergency Overview (continued):**

or vapors which may present health hazards, if the exposure limits described in Section 2 are exceeded. The health hazards described below relate to these non-routine operations, as well as exposure to component materials.

**Primary Routes of Entry:** Inhalation, ingestion, skin contact

Wet or dry grinding of cemented carbide products will produce dusts of potentially hazardous ingredients which can be inhaled, swallowed, or come in contact with the skin or eyes.

**Acute Health Effects:**

Dust from grinding can cause irritation of the nose, throat, lungs, eyes, and mucous membranes. Skin exposure can cause an allergic red rash (cobalt itch).

**Chronic Health Effects:**

Chronic exposure to respirable dust containing cobalt and tungsten carry the potential to cause permanent respiratory diseases, including occupational asthma, interstitial pneumonitis and fibrosis (hard-metal disease), and emphysema. Symptoms include productive cough, wheezing, dyspnea (upon exertion), pleuritic chest pain, and weight loss. Skin sensitization is also noted in a small percentage of cases. Reports outside the industry suggest that ingestion of significant amounts of cobalt can cause blood, heart, and other organ effects.

**Carcinogenicity:**

Cobalt is listed by IARC as Category 2B – possibly carcinogenic to humans. Cobalt is listed by ACGIH as an animal carcinogen. Cobalt is known to the State of California to cause cancer.

## SECTION 4

## FIRST AID MEASURES

**Inhalation:**

If symptoms of pulmonary involvement develop (coughing, wheezing, dyspnea, etc.), remove to fresh air. If symptoms persist, seek medical attention.

**Skin Contact:**

If irritation or rash occurs, thoroughly wash affected area with soap and water. If irritation or rash persists, seek medical attention.

**Eye Contact:**

Remove contact lenses at once. Flush eyes with water for at least fifteen minutes. If irritation persists, seek medical attention.

**Ingestion:**

If swallowing of greater than trace amounts is suspected, drink large amounts of water.

## SECTION 5

## FIRE FIGHTING MEASURES

**Flash Point:** Not applicable

**Lower Explosive Limit:** Not applicable

**Upper Explosive Limit:** Not applicable

Cemented carbide products are not a fire hazard under normal conditions of use. However, dusts generated in grinding may be sensitive to static discharge or ignite if allowed to accumulate, then be exposed to an ignition source.

**Extinguishing Media:**

For dust fires, smother with dry sand, dry dolomite, ABC type fire extinguisher, or flood with water.

**Special Fire Fighting Procedures:**

For a dust fire confined to a small area, use a respirator approved for toxic dusts and fumes. For a large fire involving this material, fire fighters should use a self-contained breathing apparatus. See Section 3 and 8 for specific hazard identification and exposure control measures.

**Unusual Fire and Explosion Hazards:**

Dusts may present a fire or explosion hazard under rare favoring conditions of particle size, dispersion, concentration, and strong ignition source. However, this is not expected to be a problem under normal handling conditions.

**Hazardous Combustion Products:**

Oxides of aluminum, cobalt, titanium, and tungsten; carbon dioxide, and carbon monoxide. See Section 3 for specific hazard identification.

## SECTION 6

## ACCIDENTAL RELEASE MEASURES

**Steps to be Taken in Case Material is Released or Spilled:**

Clean up area using methods that avoid dust generation such as a high efficiency particulate air (HEPA) vacuum, wet dust mop, or wet clean-up. Use an appropriate National Institute of Occupational Safety and Health (NIOSH)-approved respirator whenever airborne concentrations of hazardous components exceed exposure limits listed in Section 2.

## SECTION 7

## HANDLING AND STORAGE

Under normal operating conditions, the use of cemented carbide products does not require special safety precautions beyond normal safety procedures for handling and using cutting tools, such as safety glasses and gloves. However, operations such as grinding, cutting, burning, and welding of cemented carbide products may generate dusts or fumes which may require special handling procedures. The procedures described below relate to these non-routine operations.

**Hygienic Practices:**

Wash hands thoroughly after handling, and before eating or smoking. Wash exposed skin at the end of the work shift. Smoking and consumption of food or beverages should be restricted from areas where hazardous components may be present. Do not shake clothing, rags, or other items to remove dust. Dust should be removed by laundering or vacuuming (with appropriate filters) the clothing, rags, or other items.

**Precautions to be Taken in Handling and Storage:**

Maintain good housekeeping procedures to prevent dust accumulation during grinding. Avoid dust inhalation and direct skin contact with dust. See Section 3 for specific health hazards.

**Other Precautions:**

Clean up using methods that avoid dust generation such as a HEPA vacuum, wet dust mop, or wet clean-up. Use a NIOSH-approved respirator whenever airborne concentrations of hazardous components exceed exposure limits listed in Section 2. See Section 6 for specific health hazards.

**Note:**

Periodic medical monitoring is recommended for individuals regularly exposed to dust or fumes, with particular attention to any potential sensitization effects of such substances.

**Personal Protection:**

Always wear safety glasses with side shields when grinding or cutting cemented carbide products. Use a NIOSH-approved respirator with a HEPA cartridge whenever airborne concentrations of hazardous components exceed exposure limits listed in Section 2. Wear protective gloves (leather or rubber) or barrier cream, and clothing to prevent skin contact with dusts. See Section 6 for specific health hazards.

**Ventilation:**

Use adequate local (preferably) or general exhaust ventilation to ensure that concentrations of dusts or fumes do not exceed exposure limits.

## SECTION 9

## PHYSICAL AND CHEMICAL PROPERTIES

<b>Appearance and Odor:</b>	Dark Gray Solid, Odorless	<b>Specific Gravity (H<sub>2</sub>O=1):</b>	Not applicable
<b>Boiling Point:</b>	Not applicable	<b>Percent Volatile by Volume:</b>	Not applicable
<b>Vapor Pressure (mm Hg):</b>	Not applicable	<b>Evaporation Rate:</b>	Not applicable
<b>Vapor Density (Air=1):</b>	Not applicable	<b>Solubility in Water:</b>	Insoluble

## SECTION 10

## STABILITY AND REACTIVITY

**Stability:** Stable

**Conditions to Avoid:** None known

**Incompatibility:** Strong acids. Contact of dust with strong oxidizers may cause fire or explosions.

**Hazardous Decomposition Products:** None

**Hazardous Polymerization:** Will Not Occur

## 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.

Rat Oral LD<sub>50</sub>: 1500 mg/kg

Rabbit Oral LD<sub>50</sub>: 20 mg/kg

Rat Intraperitoneal LD<sub>50</sub>: 250 mg/kg

Rabbit Intratracheal LD<sub>50</sub>: 100 mg/kg

Rat Intravenous LD<sub>50</sub>: 100 mg/kg

Tungsten carbide, titanium carbide, niobium carbide, vanadium carbide: Toxicity has not been quantified. May cause pulmonary and skin sensitization and mucous membrane irritation in dust form.

There is inadequate evidence for the carcinogenicity of chromium (7440-47-3) and most trivalent chromium compounds in experimental animals.

**Aquatic toxicity**

Cobalt:	Algae ( <i>Selenastrum capricornutum</i> ):	EC <sub>10</sub> 72h: 0,006 mg/l
		EC <sub>50</sub> 72h: 0,035 mg/l
		NOEC 72h: 0,0053 mg/l
Cobalt:	Daphnia (Magna):	EC <sub>50</sub> 48h: > 100 mg/l
	Fish ( <i>Brachydanio rerio</i> ):	NOEC 96h: > 100 mg/l
	Bacteria (activated sludge):	EC <sub>50</sub> : 42 mg/l
Tungsten carbide:	Algae ( <i>Scenedesmus subspicatus</i> ):	EC <sub>50</sub> 72h: 130 mg/l (grow rate)
		EC <sub>50</sub> 48h: > 1000 mg/l
	Daphnia (Magna):	LC <sub>0</sub> 96h: > 1000 mg/l
		LC <sub>50</sub> 96h: > 1000 mg/l
	Fish ( <i>Brachydanio rerio</i> ):	EC <sub>20</sub> 3h: >1000 mg/l
		EC <sub>50</sub> 3h: >1000 mg/l

## SECTION 13

## DISPOSAL CONSIDERATIONS

**Waste Disposal Method:**

Dispose of in accordance with appropriate government regulations. May be sold as scrap for reclamation.

## SECTION 14

## TRANSPORTATION INFORMATION

DOT Proper Shipping Name:	Not regulated by this mode of transportation
IMO Proper Shipping Name:	Not regulated by this mode of transportation
IATA Proper Shipping Name:	Not regulated by this mode of transportation
AFI Prop. Shipping Name:	Not regulated by this mode of transportation

## SECTION 15

## REGULATORY INFORMATION

OSHA:

This product, under normal conditions of use, is not hazardous under the criteria of the Federal OSHA Hazard Communication Standard 29 CFR 1910.1200. However, dust generated while grinding, cutting, burning or welding this product may be hazardous as noted in Sections 2 and 3.

TSCA:

Components of this product are listed on the TSCA inventory.

SARA:

Chromium and cobalt are subject to the requirements of Section 313 of Title III of Superfund Amendment and Reauthorization Act of 1986.

State Regulatory Information:

This product contains cobalt, which is listed in California Proposition 65 as a known cancer-causing chemical.

Users 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, 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 Carboloy 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 Carboloy 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. This information may not be valid for these products when manufactured with alternate materials meeting the special requirements of a particular user.

CARBOLOY INC. MAKES NO WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

**SECTION 1 COMPANY AND PRODUCT INFORMATION PAGE 1 OF 6**

**Product Name:** All CARBOLOY® or SECO® Boring Bars, Cartridges, Milling Cutters and Tool Holders  
**Product Descriptions:** Tool Steel  
**Manufacturer/Supplier:** Carboloy Inc.  
 11177 East Eight Mile Road  
 Warren, MI 48089  
**Date Prepared:** April 6, 2000  
**Emergency Telephone:** CHEMTREC: (800) 424-9300  
**Non-Emergency Telephone:** (586) 497-5000 - Fax (586) 497-5362  
**NFPA Hazard Rating:** HEALTH 0; FLAMMABILITY 0; REACTIVITY 0

**SECTION 2 COMPOSITION, INFORMATION ON INGREDIENTS**

Material (CAS #)	Percent by Weight	OSHA PEL-TWA (mg/m <sup>3</sup> )	ACGIH TLV-TWA (mg/m <sup>3</sup> )
Base Metal			
Iron (as Fe) (7439-89-6)	Balance	10 as Fe <sub>2</sub> O <sub>3</sub> fume	5 as Fe <sub>2</sub> O <sub>3</sub> fume and dust
Alloying Elements			
Aluminum (7429-90-5)	0.10 - 1.8	15 as total dust	10 as dust; 5 as fume
Carbon (7440-44-0)	0.01 - 3	Not established	Not established
Chromium (7440-47-3)	0.01 - 14	0.5	0.5
Cobalt (7440-48-4)	0-12	0.1 as dust and fume	0.02 as fume
Copper (7440-50-8)	0.04 - 0.7	0.1 as fume; 1.0 as dust	0.2 as fume; 1.0 as dust
Lead (7439-92-1)	0.15 - 0.35	0.05	0.05
Manganese (7439-96-5)	0.05 - 3	5 (Ceiling Limit)	0.2
Molybdenum (7439-98-7)	0.01 - 9	Not established	10 (NIC - 3)
Nickel (7440-02-0)	0.01 - 10	1.0	1.0 as nickel
Phosphorous (7723-14-0)	0.15 Max	0.1	0.1 as phosphorous
Silicon (7440-21-3)	0 - 3	15 as nuisance dust	10
Sulfur (as sulfur dioxide) (7704-34-9)	0.001 - 0.35	13 as sulfur dioxide	5.2 as sulfur dioxide
Tungsten (7440-33-7)	0 - 19	Not established	5 for insoluble compounds
Vanadium (7440-62-2)	0.01 - 5	0.5 as V <sub>2</sub> O <sub>5</sub> dust; 0.1 as V <sub>2</sub> O <sub>5</sub> fume	0.05 as V <sub>2</sub> O <sub>5</sub> dust and fume
Zinc (1314-13-2)	10 Max	5 as ZnO fume; 15 as ZnO dust	5 as ZnO fume; 10 as ZnO dust

Ceiling Limit is a concentration that should not be exceeded at any time during the workday.

NIC means *notice of intent to change* for 1999

Note: The above listing is a summary of elements used in alloying steel. Various grades of steel will contain different combinations of these elements. Trace elements may also be present in minute amounts.

**Emergency Overview:**

Boring bars, cartridges, milling cutters and tool holders in their natural state do not present an inhalation, ingestion, or contact health hazard. However, operations such as welding, burning, sawing, grinding and possibly machining, which results in elevating the temperature of the product to or above its melting point or results in the generation of airborne particulates may present hazards. The above operations should be performed in well-ventilated areas. The major exposure route is inhalation.

**Primary Routes of Exposure:** Inhalation, skin contact

**Acute Health Effects:**

Excessive inhalation of metallic fumes and dusts may result in irritation of eyes, nose, and throat. High concentrations of fumes and dusts of iron oxide, manganese, copper, zinc, and lead may result in metal fume fever. Typical symptoms consist of a metallic taste in the mouth, dryness and irritation of the throat, chills and fever. These symptoms may persist from 12 to 48 hours.

**Chronic Health Effects:**

Chronic and prolonged inhalation of high concentrations of fumes or dust of the following elements may lead to the conditions listed:

Chromium or nickel - various forms of dermatitis, inflammation and/or ulceration of the upper respiratory tract, and possibly cancer of nasal passages and lungs. Based on available information, there does not appear to be any evidence that exposure to welding fume induces human cancer.

Cobalt - Chronic exposure to dusts, fumes and mists containing cobalt carry the potential to cause permanent respiratory diseases, including occupational asthma, interstitial pneumonitis and fibrosis (hard-metal disease), and emphysema. Symptoms include productive cough, wheezing, dyspnea upon exertion, pleuritic chest pain, and weight loss. Skin sensitization is noted in a small percentage of cases.

Copper – irritation of the upper respiratory tract and metal fume fever, a flu-like illness.

Iron (as iron oxide) – prolonged exposure may produce pulmonary effects and/or siderosis.

Lead - prolonged exposures can cause behavioral changes, kidney damage, peripheral neuropathy characterized by decreased hand grip strength, and adverse reproductive effects.

Manganese - bronchitis, pneumonitis, lack of coordination

Tungsten - some evidence of pulmonary involvement such as cough

Vanadium (as vanadium pentoxide) –eye and respiratory tract irritant.

**Carcinogenicity:**

Cobalt is listed by IARC as Category 2B – possibly carcinogenic to humans. Cobalt is listed by ACGIH as an animal carcinogen. Cobalt is known to the State of California to cause cancer.

Chromium is listed by NTP as a human carcinogen. Chromium is listed by IARC as Category 3 – unclassifiable as to carcinogenicity in humans. Chromium is listed by ACGIH as A4 – not classifiable as a human carcinogen.

Lead is listed by NTP and IARC as a human carcinogen. Lead is listed by ACGIH as A3 – confirmed animal carcinogen with unknown relevance to humans. Lead is known to the State of California to cause cancer.

Nickel is listed by NTP and IARC as a human carcinogen. Nickel is listed by ACGIH as A1 – confirmed human carcinogen. Nickel is known to the State of California to cause cancer.



**Inhalation:**

If symptoms of pulmonary involvement develop (e.g., coughing, wheezing, dyspnea, etc.), remove to fresh air. If symptoms persist, seek medical attention.

**Skin Contact:**

If irritation or rash occurs, thoroughly wash affected area with soap and water. If irritation or rash persists, seek medical attention.

**Eye Contact:**

Remove contact lenses at once. Flush eyes with water for at least fifteen minutes. If irritation persists, seek medical attention.

**Ingestion:**

If swallowing of greater than trace amounts is suspected, drink large amounts of water.

## SECTION 5

## FIRE FIGHTING MEASURES

**Flash Point:** Not applicable      **Lower Explosive Limit:** Not applicable      **Upper Explosive Limit:** Not applicable

Tool steel products are not a fire hazard under normal conditions of use. Tool steel dust generated in grinding may be sensitive to static discharge or ignite if allowed to accumulate and be exposed to an ignition source.

**Extinguishing Media:**

For dust fires, smother with dry sand, dry dolomite, ABC type fire extinguisher, or flood with water.

**Special Fire Fighting Procedures:**

For a dust fire confined to a small area, use a respirator approved for toxic dusts and fumes. For a large tool steel fire, use a self-contained breathing apparatus. See Section 3 and 8 for specific hazard identification and exposure control measures.

**Unusual Fire and Explosion Hazards:**

Dusts may present a fire or explosion hazard under rare conditions of particle size, dispersion, concentration, and strong ignition source. This is not expected to be a hazard under normal handling conditions.

**Hazardous Combustion Products:**

Oxides (respirable particulates) of aluminum, cobalt, titanium, and tungsten; carbon dioxide, and carbon monoxide. See Section 3 for specific hazard identification.

## SECTION 6

## ACCIDENTAL RELEASE MEASURES

**Steps to be Taken in Case Material is Released or Spilled:**

Clean area using methods that avoid dust generation, such as a high-efficiency particulate air (HEPA) vacuum, wet dust mop, or wet clean-up. Use an appropriate National Institute of Occupational Safety and Health (NIOSH)-approved respirator whenever airborne concentrations of hazardous components exceed exposure limits listed in Section 2.

## SECTION 7

## HANDLING AND STORAGE

Under normal operating conditions, the use of tool steel products do not require special safety precautions beyond normal safety procedures for handling and using cutting tools, such as safety glasses with side shields and gloves.

Operations such as grinding, cutting, burning, and welding of tool steel products may generate dusts or fumes which may require special handling procedures.

**Hygienic Practices:**

Wash hands thoroughly after handling, and before eating or smoking. Wash exposed skin at the end of the work shift. Smoking and consumption of food or beverages should be restricted from areas where hazardous components may be present. Do not shake clothing, rags, or other items to remove dust. Do not use compressed air to remove dust. Dust should be removed by laundering or vacuuming (with appropriate filters).

**Precautions to be Taken in Handling and Storage:**

Maintain good housekeeping procedures to prevent dust accumulation during grinding. Avoid inhaling dust and direct skin contact with dust. See Section 3 for specific health hazards.

**Other Precautions:**

Other precautions not indicated.

**Note:**

Periodic medical monitoring is recommended for individuals regularly exposed to dust or fumes, with particular attention to any potential sensitization effects of alloy metals.

## SECTION 8

## EXPOSURE CONTROLS, PERSONAL PROTECTION

**Personal Protection:**

Wear safety glasses with side shields when grinding or cutting tool steel products. Use a NIOSH-approved respirator with a HEPA cartridge whenever airborne concentrations of hazardous components exceed exposure limits listed in Section 2. Wear protective gloves (leather or rubber) or barrier cream, and protective clothing to prevent skin contact with dusts. See Section 3 for specific health hazards.

**Ventilation:**

Use adequate local (preferably) or general exhaust ventilation to ensure that concentrations of dusts or fumes do not exceed exposure limits.

## SECTION 9

## PHYSICAL AND CHEMICAL PROPERTIES

<b>Appearance and Odor:</b>	Gray-black solid with metallic luster, Odorless	<b>Specific Gravity (H<sub>2</sub>O=1):</b>	Not applicable
<b>Boiling Point:</b>	Not applicable	<b>Percent Volatile by Volume:</b>	Not applicable
<b>Vapor Pressure (mm Hg):</b>	Not applicable	<b>Evaporation Rate:</b>	Not applicable
<b>Vapor Density (Air=1):</b>	Not applicable	<b>Solubility in Water:</b>	Insoluble

## SECTION 10

## STABILITY AND REACTIVITY

**Stability:** Stable

**Conditions to Avoid:** None known

**Incompatibility:** Strong acids. Contact of dust with strong oxidizers may cause fire or explosions.

**Hazardous Decomposition Products:** Respirable metal oxide fume.

**Hazardous Polymerization:** Will Not Occur

Cobalt: The International Agency for Research on Cancer (IARC) lists cobalt and cobalt compounds as Category 2B carcinogens (Possibly Carcinogenic to Humans).

Rat Oral LD<sub>Lo</sub>: 1500 mg/kg

Rabbit Oral LD<sub>Lo</sub>: 20 mg/kg

Rat Intraperitoneal LD<sub>Lo</sub>: 250 mg/kg

Rabbit Intratracheal LD<sub>Lo</sub>: 100 mg/kg

Rat Intravenous LD<sub>Lo</sub>: 100 mg/kg

There is inadequate evidence for the carcinogenicity of chromium metal (7440-47-3) and most trivalent chromium compounds in experimental animals.

Lead is listed by IARC as Category 2B.

Rat Intraperitoneal LD<sub>Lo</sub>: 1000 mg/kg

Pigeon Oral LD<sub>Lo</sub>: 160 mg/kg

Nickel is listed by NTP and IARC as a human carcinogen.

Rat Intraperitoneal LD<sub>Lo</sub>: 12 mg/kg

Dog Intravenous LD<sub>Lo</sub>: 10 mg/kg

Mouse Intravenous LD<sub>Lo</sub>: 50 mg/kg

Rabbit Intraperitoneal LD<sub>Lo</sub>: 7 mg/kg

Guinea pig Oral LD<sub>Lo</sub>: 5 mg/kg Cat Subcutaneous LD<sub>Lo</sub>: 12.5 mg/kg

Rabbit Subcutaneous LD<sub>Lo</sub>: 7.5 mg/kg

Vanadium pentoxide is not listed by NTP.

Rat Oral LD<sub>50</sub>: 10 mg/kg

Mouse Oral LD<sub>50</sub>: 23 mg/kg

Rat Subcutaneous LD<sub>50</sub>: 14 mg/kg

Mouse Subcutaneous LD<sub>50</sub>: 10 mg/kg

Rat Intraperitoneal LD<sub>50</sub>: 12 mg/kg

Rabbit Subcutaneous LD<sub>Lo</sub>: 20 mg/kg

Guinea pig Subcutaneous LD<sub>Lo</sub>: 20 mg/kg

Rabbit Intravenous LD<sub>Lo</sub>: 10 mg/kg

Rat Intravenous LD<sub>Lo</sub>: 25 mg/kg

## SECTION 12

## ECOLOGICAL INFORMATION

No data available.

## SECTION 13

## DISPOSAL INFORMATION

**Waste Disposal Method:**

Dispose of in accordance with appropriate government regulations. May be sold as scrap for reclamation.

## SECTION 14

## TRANSPORTATION INFORMATION

DOT Proper Shipping Name:

Not regulated by this mode of transportation

IMO Proper Shipping Name:

Not regulated by this mode of transportation

IATA Proper Shipping Name:

Not regulated by this mode of transportation

AFI Prop. Shipping Name:

Not regulated by this mode of transportation

**OSHA:**

This product is not hazardous under the criteria of the Federal OSHA Hazard Communication Standard 29 *CFR* 1910.1200. Dust generated while using this product may be hazardous as noted in Sections 2 and 3.

**TSCA:**

Components of this product are listed on the TSCA inventory.

**SARA:**

Aluminum, chromium, cobalt, copper, lead, manganese, nickel, phosphorus, vanadium, and zinc are subject to the requirements of Section 313 of Title III of Superfund Amendment and Reauthorization Act of 1986.

**State Regulatory Information:**

This product contains chromium, cobalt, lead, and nickel, which are listed in California Proposition 65 as known cancer-causing chemicals.

## SECTION 16

## OTHER INFORMATION

**Users Responsibilities:**

This Material Safety Data Sheet provides information consistent with recommended applications of tool steel products and anticipated non-routine activities involving these products. It is the user's responsibility to identify and protect against health and safety hazards presented by modification of tool steel products after manufacture. Individuals handling tool steel 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 tool steels. The information is offered in good faith as accurate and correct, 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 Carboloy Inc's. control. Variations in methods, conditions, equipment used to store, handle, or process the material, and hazards connected with the use of the tool steel products are solely the responsibility of the user and remain at its sole discretion.

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 Carboloy 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. This information may not be valid for these products when manufactured with alternate materials meeting the special requirements of a particular user.

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