

Greenfield Industries Inc.

SAFETY DATA SHEET

SDS # 02

Date of Issue: May 2014

Supersedes: July 2013

SECTION 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: All Rotary Tool Carbide Grades, Brazed Tools and blanks

Chemical Name: Tungsten Carbide Product with Cobalt/Nickel binder and Brazed Carbide Products

Synonyms: Hard Metal, Cemented WC, Tungsten Carbide

Product Use: Metalworking Tools, Metallurgical Products, Powders and Inserts

Manufacturer: Greenfield Industries Inc., 2501 Davis Creek Rd., Seneca, SC 29678

EMERGENCY TELEPHONE NUMBER: CHEM-TEL INC. 1-800-255-3924

SECTION 2 - HAZARD(S) IDENTIFICATION

Note: Health effects listed are for exposure to metallurgical powders, dust, vapor or mist from grinding, welding or brazing. No health effects have been reported for exposure to this material in solid form.]

In the form of a powder, this odorless, colorless, gray material may be flammable and may cause respiratory and/or skin irritation. Overexposure to this material in the form of metallurgical powder, dust, vapor or mist from grinding or sweeping is hazardous to health. Cobalt is an eye, skin, and mucous membrane irritant and may cause temporary or permanent respiratory disease. Permanent respiratory disease can lead to disability or death. Preexisting pulmonary and skin conditions such as emphysema, asthma, bronchitis and dermatitis may be aggravated by exposure to this material.

Inhalation: Irritant/Sensitizer: 10 mg (Ni)/m³, 20 mg (Co)/m³ is immediately dangerous to life and health.

Acute Overexposure: May cause respiratory tract irritation with wheezing, shortness of breath, and fits of coughing which may produce blood and soreness in the chest. 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. 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 3 - COMPOSITION/INFORMATION ON INGREDIENTS

Material	CAS Number	% by Weight	OSHA PEL TWA (mg/m ³)	ACGIH TLV TWA (mg/m ³)	NFPA HAZARD RATING SCALE		
					Health	Fire	Reactivit y
CEMENTED CARBIDE; Cobalt binder							
**Tungsten Carbide (WC)	12070-12-1	40-97	15	10	1	0	0
*Cobalt (Co)	7440-48-4	3-30	0.1	0.02	2	3	0
**Tantalum Carbide (TaC)	12070-06-3	0-30	15	10	No rating	0	0
**Titanium Carbide (TiC)	12070-08-5	0-15	15	10	No rating	0	0
**Vanadium Carbide (VC)	12070-10-9	0-0.5	15	10	No rating	0	0
**Niobium Carbide (NbC)	12069-94-2	0-5	15	10	No rating	0	0
CEMENTED CARBIDE; Nickel binder							
<i>May contain any of the above, except cobalt, plus:</i>							
*Nickel (Ni)	7440-02-0	3-20	1	1.5	2	0	0
CEMENTED CARBIDE; coated							
<i>May contain any of the above, plus:</i>							
Aluminum Oxide (AlO)	1344-28-1	0-0.5	5	10	1	0	0
**Titanium Nitride (TiN)	25583-20-4	0-0.5	15	10	No rating	0	0
CEMENTED CARBIDE; brazed products							
<i>May contain any of the above, except the coatings, plus:</i>							
*Silver (Ag)	7440-22-4	1-20	0.01	0.1	1	3	3
*Copper (Cu)	7440-50-8	1-10	1	1	2	3	0
Zinc (Zn)	7440-66-6	1-10	5	None est.	0	1	1
CEMENTED CARBIDE ; tube rod							
<i>Same as cemented carbide with cobalt binder, plus:</i>							
Iron (Fe)	7439-89-6	25-50	10	None est.	0	3	0
*Silicomanganese (SiMn)	12743-28-1	1-6	5 (ceiling)	0.2	3	3	0

*Identifies substances that are subject to the requirements of Section 313 of Title III of Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.

**This substance is regulated by OSHA as a Particulate Not Otherwise Regulated (PNOR). The exposure limits listed for both OSHA and ACGIH refer to total dust; the OSHA PEL for the respirable fraction is 5 mg/m³.

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 artificial respiration. 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 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: 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: 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. Get medical attention immediately. Induce vomiting only if specifically instructed by a physician.

SECTION 5 - FIRE FIGHTING MEASURES

Fire and Explosion Hazards: Under rare favoring conditions, finely divided powder or dust from grinding is expected to be a fire and explosion hazard when exposed to high temperatures or ignition sources. Particle size and dispersion in air determine reactivity. **This product, except as powder or dust, is not a fire hazard.**

Flash Point: Not applicable.

Firefighting Media: For localized powder fires, smother with dry sand, dry dolomite, sodium chloride or soda ash. Use fire extinguishing media appropriate to fight surrounding fire.

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, or withdraw and let fire burn. Use powdered sodium chloride, or suitable dry powder. Avoid breathing fumes from burning material. Firefighting personnel must use proper respiratory protection and protective fire suits.

SECTION 6 - ACCIDENTAL RELEASE MEASURES

Steps to be Taken if Material is Released or Spilled: Sweep up with minimum amount of dust generation and place in suitable clean, dry containers for later disposal or reclamation. Residue should be cleaned up using a high efficiency particulate filter vacuum or wet clean up. Use appropriate personal protective equipment including respiratory protection.

SECTION 7 - HANDLING AND STORAGE

Handling and Storage: Minimize free fall of powder and avoid dispersion of dust in air. 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, cool area.

Other Precautions: Wash hands thoroughly after handling, before eating or smoking. Do not shake clothing, rags or other items to remove dust. Dust should be removed by washing or vacuuming. Periodic examinations are recommended for individuals regularly exposed to dust or mist.

SECTION 8 - EXPOSURE CONTROLS/PERSONAL PROTECTION

Ventilation: Provide local exhaust ventilation or general dilution to maintain exposure levels below the PEL and TLV.

Respiratory Protection for Cobalt:

0.05 mg (Co)/m³ - Single-use approved dust and mist respirator.

0.5 mg (Co)/m³ - Dust mask, except single-use respirator.

1 mg (Co)/m³ - Dust mask, except single-use and quarter-mask respirator. Fume or high efficiency particulate respirator.

5 mg (Co)/m³ - High efficiency particulate respirator with a full facepiece. Supplied-air respirator with a full facepiece, helmet or hood. Self-contained breathing apparatus with a full facepiece.

20 mg (Co)/m³ - Powered air-purifying respirator with a 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.

Respiratory Protection for Nickel:

>1 mg(Ni)/m³ - Self-contained breathing apparatus with a full facepiece operated in pressure-demand or other positive-pressure mode. Supplied-air respirator with a full facepiece operated in pressure-demand or other positive-pressure mode in combination with an auxiliary SCBA 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: Employee must wear appropriate protective clothing and equipment to prevent repeated or prolonged skin contact with this substance. Soiled clothing should be laundered separately.

Gloves: Employee must wear appropriate protective gloves or barrier creams to prevent contact with this substance.

Eye Protection: 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 eye wash fountain within the immediate work area for emergency use. Contact lenses should not be worn when handling these materials.

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

Appearance and Odor: Gray powder or solid, no odor

Boiling Point: N/A

Solubility in Water: Practically insoluble

Melting Point: N/A

Petroleum Based Solvent Solubility: Practically insoluble Specific Gravity: (H₂O = 1): 11 to 15.5

SECTION 10 - STABILITY AND REACTIVITY

Stability: Stable under normal temperatures and pressure.

Decomposition: Thermal decomposition may release acrid smoke and irritating fumes.

Incompatibilities: Contact of dust with strong oxidizers may cause fire or explosions.

SECTION 11 - TOXICOLOGICAL INFORMATION

Cobalt: Carcinogenic status: 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 LD₅₀: 1500 mg/kg.

Rabbit Oral LD₅₀: 20 mg/kg

Rat Intraperitoneal LD₅₀: 250 mg/kg

Rabbit Intratracheal LD₅₀: 100 mg/kg

Rat Intravenous LD₅₀: 100 mg/kg

Nickel: Carcinogenic status: The International Agency for Research on Cancer (IARC) lists metallic Nickel and Nickel compounds as Category 2B carcinogens (Possibly Carcinogenic to Humans). Epidemiological studies indicate an increased incidence of cancer of the nasal cavity, lungs and possibly the larynx in nickel refinery workers. Nickel is an eye, skin, and mucous membrane irritant, and a pulmonary and skin sensitizer.

Rat Oral LD₅₀: 5 mg/kg.

Dog Intravenous LD₅₀: 10 mg/kg

Guinea Pig Subcutaneous LD₅₀: 500 mg/kg

Rat Intratracheal LD₅₀: 12 mg/kg

Mouse Intravenous LD₅₀: 50 mg/kg

Copper: Copper is a skin, eye, and mucous membrane irritant and skin sensitizer. Individuals with chronic respiratory or skin disorders may be at increased risk from exposure.

Human Oral LD₅₀: 120 mg/kg.

SECTION 12 - ECOLOGICAL INFORMATION

No data are available. Solids and dust should be recycled, if possible, instead of sending to landfill.

SECTION 13 - DISPOSAL CONSIDERATIONS

Waste Disposal Method: 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, provincial/state, and local environmental regulations.

SECTION 14 - TRANSPORT INFORMATION

Some finely divided tungsten carbide powder may be classified as 'flammable solid' according to the Department of Transportation and International Air Transportation Association guidelines. If a regulated powder is resold and shipped in the same physical form it was received, appropriate labeling, marking, documenting, and placarding must accompany the shipment.

SECTION 15 - REGULATORY INFORMATION

Some ingredients in cemented tungsten carbide products, including Tungsten, Cobalt, Nickel, Copper, Chromium and Chromium Compounds, are subject to the requirements of Section 313 of Title III of Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.

WHMIS Classification: Class D. Subdivision B. Division 2.

In the form of a pressed and sintered item, this is a manufactured article and is **not** a "controlled product" under WHMIS.

SECTION 16 - OTHER INFORMATION

Although Greenfield Industries Inc. has attempted to provide current and accurate information herein, Greenfield Industries Inc. makes no representations regarding the accuracy or completeness of the information and assumes no liability for any loss, damage, injury of any kind which may result from or arise out of the use of or reliance on the information by any person.

For technical information contact Greenfield Industries Inc., 864-654-4922 or fax 864-654-8126.
For additional SDSs, contact Greenfield Industries Inc., Customer Service at 800-348-2885.

Prepared by: Greenfield Industries Inc. Quality and Metallurgy Department (May 2014)