SECTION 1 COMPANY AND PRODUCT INFORMATION

Product Name: High Speed Steel Tool Products - Coated or Uncoated

Product Descriptions: All high speed steel tool products such as drills, end mills and other cutting tool products.

Manufacturer:

Date Prepared: November 16, 2012

Emergency Telephone:

Non-Emergency Telephone:

Non-Emergency Fax:

NFPA Hazard Rating: HEALTH 1; FLAMMABILITY 0; REACTIVITY 0.

SECTION 2 HAZARDS IDENTIFICATION

Emergency Overview:
During normal operation and usage, high speed steel tool products do not present inhalation, ingestion, or other chemical hazards. However, operations such as grinding, cutting, machining, burning, and welding of such products may release dusts, fumes, or vapors which may present health hazards, if the exposure limits described in Section 3 are exceeded. The above operations should be performed in well ventilated areas. 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 high speed steel tool products will produce dusts of potentially hazardous ingredients which can be inhaled, swallowed, or come in contact with the skin or eyes. During wet grinding, the dust can be suspended or dissolved in the coolant mist.

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 - may be toxic to kidneys, lungs, liver, upper respiratory tract. Repeated or prolonged exposure can produce target organs damage.

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 - may be toxic to blood, lungs, brain, central nervous system (CNS). Repeated or prolonged exposure to the substance can produce target organs damage.

Nickel - various forms of dermatitis, inflammation and/or ulceration of the upper respiratory tract, and possibly cancer of nasal passages and lungs.

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 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 IARC as Category 2B – possibly carcinogenic to humans. Nickel is considered reasonably anticipated to be a carcinogenic by NTP. Nickel is listed by ACGIH as A1 – confirmed human carcinogen. Nickel is known to the State of California to cause cancer.

SECTION 3 COMPOSITION, INFORMATION ON INGREDIENTS

Material (CAS #)	**Percent by Weight***	**OSHA PEL-TWA**	**ACGIH TLV-TWA**
Aluminum (7429-90-5)	0 - 2	15 mg/m^3	10 mg/m^3
Bismuth (7440-69-9)	0 – 0.5	---	---
Boron (744-42-8) (Limit as BO)	0 – 1	15 mg/m^3	10 mg/m^3
Carbon (7440-44-0) (Limit as carbon black)	.01 - 3	3.5 mg/m^3	3.5 mg/m^3
Chromium (7440-47-3)	0.01 – 20	0.5 mg/m^3	0.5 mg/m^3
Cobalt (7440-48-4)	0 - 15	0.1 mg/m^3	0.02 mg/m^3
Columbium (7440-30-1)	0 – 0.35	---	---
Copper (744-50-8)	0 – 2	1 mg/m^3	1 mg/m^3
Iron (7439-89-6) (Limit as Fe_2O_3)	70 – 90	10 mg/m^3	5 mg/m^3
Lead (7439-92-1)	0 – 0.3	0.05 mg/m^3	0.05 mg/m^3
Manganese (7439-96-5)	0.04 - 3	5 mg/m^3	0.2 mg/m^3
Molybdenum (7439-98-7)	0.01 – 12		
	(Insoluble – Inhalable Fraction)	15 mg/m^3	10 mg/m^3
	(Insoluble – Respirable Fraction)	---	3 mg/m^3
Nickel (7440-02-0)	0 – 10	1 mg/m^3	1.5 mg/m^3
Phosphorus (7723-14-0)	0 - .15	0.1 mg/m^3	0.1 mg/m^3
Silicon (7440-21-3)	0 - 3	15 mg/m^3	10 mg/m^3
Sulfur (7704-34-9) (Limit as SO_2)	0 – 0.035	---	---
Tungsten (7440-33-7)	0 - 25	---	5 mg/m^3
Vanadium (1314-62-1)	0 - 5	0.5 mg/m^3	0.5 mg/m^3
Zinc (1314-13-2)) (Limit as ZnO)	0 - 10		
	Fume	5 mg/m^3	5 mg/m^3
	Total Dust	15 mg/m^3	---
	Respirable Fraction	5 mg/m^3	2 mg/m^3

Notes:
* Exact Percentages Depend on Grade Specifications --- Not established

Products may be coated with any of the following	Percent by Weight*	OSHA PEL-TWA	ACGIH TLV-TWA
Aliphatic Hydrocarbons (64742-47-8)	0 – 0.5	---	---
Aluminum Oxide (1344-28-1)	0 – 0.5	15 mg/m^3	10 mg/m^3
Boron Carbide (12069-32-8) (Limit as BO)	0 – 0.5	15 mg/m^3	10 mg/m^3
Chromic Acid Flake (1332-82-0) (Limit as Cr)	0 – 0.5	0.5 mg/m^3	0.5 mg/m^3
Chromium Carbide (12012-35-0) (Limit as Cr)	0 – 0.5	0.5 mg/m^3	0.5 mg/m^3
Chromium Nitride (24094-93-7) (Limit as Cr)	0 – 0.5	0.5 mg/m^3	0.5 mg/m^3
Graphite (7782-42-5)	0 – 0.5	15 mg/m^3	2 mg/m^3
Paraffinic Petroleum Distillate (64742-56-9)	0 – 0.5	---	---
Titanium Aluminum Nitride	0 – 0.5	---	---
Titanium Carbo Nitride (1234-09-0)	0 – 0.5	---	---
Titanium Nitride (25583-20-4)	0 – 0.5	---	---
Zinc (1314-13-2)) (Limit as ZnO dust)	0 – 0.5	15 mg/m^3	---

Notes:
* Exact Percentages Depend on Grade Specifications --- Not established

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 substantial quantities are swallowed seek medical attention.

SECTION 5 FIRE FIGHTING MEASURES

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

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 fire involving this material, fire fighters should use a self-contained breathing apparatus. See Section 2 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. However, this is not expected to be a problem under normal handling conditions.

Hazardous Combustion Products:
Oxides (respirable particulates) of aluminum, cobalt, titanium, and tungsten; carbon dioxide, and carbon monoxide. See Section 2 for specific hazard identification.

SECTION 6 ACCIDENTIAL 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 3.

SECTION 7 HANDLING AND STORAGE

Under normal operating conditions, the use of high speed steel tool products do 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 high speed steel tool 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. Do not use compressed air to remove dusts. 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 2 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 3. See Section 2 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 alloy metals.

SECTION 8 EXPOSURE CONTROLS, PERSONAL PROTECTION

Personal Protection:
Always wear safety glasses with side shields when grinding or cutting high speed steel tool products. Use a NIOSH-approved respirator, with the proper assigned protection factor, whenever airborne concentrations of hazardous components exceed exposure limits listed in Section 3. Protective gloves or barrier cream, and clothing to prevent skin contact with dusts are recommended. See Section 2 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

Appearance and Odor:	Grey-black solid with metallic luster, Odorless	**Specific Gravity (H_2O=1):**	Not applicable
Boiling Point:	Not applicable	**Percent Volatile by Volume:**	Not applicable
Vapor Pressure (mm Hg):	Not applicable	**Evaporation Rate:**	Not applicable
Vapor Density (Air=1):	Not applicable	**Solubility in Water:**	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_{Lo}: 1500 mg/kg
Rat Intraperitoneal LD_{Lo}: 250 mg/kg
Rat Intravenous LD_{Lo}: 100 mg/kg
Rabbit Oral LD_{Lo}: 20 mg/kg
Rabbit Intratracheal LD_{Lo}: 100 mg/kg

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

Nickel: 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 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 LD_{Lo}: 5 mg/kg
Guinea Pig Subcutaneous LD_{Lo}: 500 mg/kg
Mouse Intravenous LD_{Lo}: 50 mg/kg
Dog Intravenous LD_{Lo}: 10 mg/kg
Rat Intratracheal LD_{Lo}: 12 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.

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Aquatic toxicity

Cobalt:	Algae (Selenastrum capriconutum):	EC_{10} 72h: 0,006 mg/l EC_{50} 72h: 0,035 mg/l NOEC 72h: 0,0053 mg/l
Cobalt:	Daphnia (Magna):	EC_{50} 48h: > 100 mg/l
	Fish (Brachydanio rerio):	NOEC 96h: > 100 mg/l
	Bacteria (activated sludge):	EC_{50}: 42 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 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 the 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 PAGE 6 OF 6

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 high speed steel tool products after manufacture. Individuals handling high speed steel tool 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 high speed steel tool 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 **(Company Name)** 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.

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