KENNAMETAL

MATERIAL SAFETY DATA SHEET

MSDS # 004	Revision Date: 05/17/2012
K-0963-004	Supercedes: 04/05/2012

1. PRODUCT AND COMPANY IDENTIFICATION

Product Names/Powder Grades Group A:	**2606SC, 2606SCW, 2606X02, 2606X03, K313, K313X03, K313X62, K313Y02, K313Y62, K6, KB1610, KB5625, KC210, KC410M, KC5010, KC510M, KC520M, KC5410, KC705M, KC709M, KC730, KC730SC, KC7310, KC732, KC7320, KC7325, KC915M, KC920M, KC992M, KD050, S114, S114SC, S114SCW, S114X02, X199**
Group B:	**CG55, X181SC, X181SH**
Group C:	**WX032**
Group D:	**2612SC, 2612SCW, 2612X02, 2612X03, 2612Y22, 2612Y22SC, CBN6, CS419, CS5, GM1515, K1, K20F-DCF, K20F-TIALN, K600, K715, KB1625, KC5025, KC522M, KC525M, KC535M, KC5125E, KC5510, KC5525, KC610, KC610M, KC620M, KC625M, KC631M, KC633M, KC635M, KC639M, KC643M, KC651M, KC7015, KC7020, KC720, KC7215, KC721M, KC7220, KC7235, KC725M, KC7315, KC735M, KC7410, KC7515, KC7935, KC9245, KC935M, KCM35, KCPK30, KCP15, KCPM15, KCU25, KCU40, KN25,KU25T, RX2035, S105, S105D900, S105SC, S105X02, S105X04, S105X07, S105X08, S105Y22, S113, S113SC, S113SCW, S113X02, S117, X160, X160MH, X160ML, X160SC, X160SH, X228, X229, RX2035Y62, S105, D796, S105D791, S105D809, S105D833, SPATC2, SPATCV, TGU25-1, TN6025 WK15PD, WM35CT, WU10P, WU25PT, WU30PT**
Group E:	**K701, K701FH1, K701FL1VC, K701-LC, K701LCSPD, K701SPD, K701X02, K701X62V, KC250, X185, X185ML, X185SC, X201SC**
Chemical Name:	Tungsten Carbide product with Cobalt binder
Synonyms:	Hard Metal, Cemented WC, Tungsten Carbide
Chemical Family:	Metal mixture
Formula:	Not applicable - mixture
Product Use:	Metalworking Tools, Metallurgical Products, Powders and Inserts

COMPANY ADDRESS
Kennametal Inc.
1600 Technology Way
P.O. Box 231
Latrobe, PA 15650

ADDITIONAL MSDS:
724-539-5000
TECHNICAL INFORMATION:
724-539-5066

EMERGENCY TELEPHONE NUMBER:
CHEMTREC: 1-800-424-9300

2. COMPOSITION/INFORMATION ON INGREDIENTS

Components	CAS Number	Group A % by Wt	Group B % by Wt	Group C % by Wt	Group D % by Wt	Group E % by Wt
*Tungsten Carbide (WC)	12070-12-1	60 – 100	60 – 100	60 – 100	60 – 100	60 – 100
Cobalt (Co)	7440-48-4	3 – 7	3 – 7	5 – 10	10 – 30	10 – 30
Chromium Carbide (CrC)	12012-35-0	0.1 – 1	1 – 5	0.1 – 1	0.1 – 1	1 – 5

Components	OSHA PEL (mg/m^3)	ACGIH TLV-TWA (mg/m^3)	Canadian Provincial Limits
*Tungsten Carbide (WC)	15	10	None
Cobalt (Co)	0.1	0.02	Alberta (TWA): 0.05 mg/m^3; STEL – 0.1 mg/m^3 British Columbia (TWA): 0.02 mg/m^3; K3 (possible human carcinogen): Sensitizer; reduce exposure to minimum possible level Manitoba, New Brunswick, Quebec (TWA/TWAEV): 0.05 mg/m^3 Ontario (TWAEV): 0.02 mg/m^3 Saskatchewan (TWA): 0.02 mg/m^3; STEL – 0.06 mg/m^3 Yukon (TWA): 0.05 mg/m^3
Chromium Carbide (CrC)	0.5	0.5	None

*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/m^3.

Additional Exposure Standards: None
OSHA REGULATORY STATUS: In solid form, not hazardous. Powder, dust or fume: irritant, lung and respiratory tract toxin, sensitizer

In solid form, this material is not hazardous (tools, inserts). Powder or dust generated from grinding of tools or inserts and fumes generated from high-temperature processes are hazardous materials.

3. HAZARDS IDENTIFICATION

WARNING!

USE ONLY WITH ADEQUATE VENTILATION. HARMFUL IF INHALED. EXPOSURE TO DUST, POWDER, OR FUMES CAN CAUSE EYE, SKIN AND RESPIRATORY TRACT IRRITATION. DUST OR POWDER CAN CAUSE RESPIRATORY SYSTEM DAMAGE. MAY CAUSE AN ALLERGIC SKIN AND/OR RESPIRATORY REACTION. KEEP CONTAINERS CONTAINING POWDER CLOSED. AVOID CONTACT WITH EYES, SKIN AND

CLOTHING. WASH THOROUGHLY AFTER HANDLING.

HAZARD RATINGS (For powder or dust)	Degree of hazard (0 = low, 4 = extreme)			
Hazardous Materials Identification System (HMIS)	Health: 3*	Flammability: 0	Reactivity: 0	Personal Protection: E
National Fire Protection Association (NFPA)	Mixture. Not rated.			

HUMAN THRESHOLD RESPONSE DATA

Odor Threshold:	Unknown
Irritation Threshold:	Unknown
Immediately Dangerous to Life or Health (IDLH) Value(s):	The IDLH for this product is not known. The IDLH for cobalt is 20 mg/m^3.

POTENTIAL HEALTH EFFECTS

ACUTE EFFECTS

Eye:	Powder or dust can cause irritation consisting of redness, swelling, and pain. May cause conjunctivitis with repeated exposures.
Skin:	Material not expected to be absorbed through the skin. Contact with dust or powder may cause irritation consisting of redness and/or swelling.
Inhalation:	Harmful if inhaled. Inhalation of high concentrations of powder, dust, or fume may cause respiratory and nasal irritation, coughing, and difficulty breathing. Exposure to high concentrations of chromium dusts or fumes can cause severe respiratory and nasal irritation.
Ingestion:	Ingestion of large amounts of dust or powder may cause nausea, diarrhea and or stomach pain.
CHRONIC EFFECTS:	Prolonged or repeated skin contact with powder or dust may cause more severe irritation or dermatitis. Prolonged or repeated inhalation of powder, dust or fume may cause more severe irritation and possibly lung damage. Chronic exposure to dust or powder may also lead to the development of permanent, severe, obstructive or fibrotic lung disease characterized by coughing, wheezing, and shortness of breath. Repeated contact with powder or dust may cause an allergic skin reaction consisting of itching, redness, swelling, and rash or urticaria (hives) in sensitized individuals. Prolonged or repeated inhalation of powder, dust or fume may cause an allergic type of asthma reaction characterized by wheezing, coughing, and extreme breathing difficulty in sensitized individuals. Prolonged or repeated exposures to chromium dusts or fumes may cause perforation of the nasal septum, bloody nose and other symptoms of severe nasal irritation. Ingestion of large amounts of cobalt may affect the heart, but this type of exposure is not anticipated under normal occupational conditions.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:
Exposure to dust or powder may aggravate an existing dermatitis, asthma, emphysema, other respiratory disease.

POTENTIAL ENVIRONMENTAL EFFECTS None known. Product has not been tested for environmental properties.

4. FIRST AID MEASURES

PROCEDURES

EYE CONTACT:	In case of contact, flush eyes with plenty of water for at least 15 minutes. If irritation persists, get medical attention.
SKIN CONTACT:	In case of contact, wash skin with plenty of water. Remove contaminated clothing and shoes and launder before reuse. If skin irritation develops and persists or recurs, get medical attention.
INHALATION:	If symptoms of lung irritation occur (coughing, wheezing or breathing difficulty), 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.
INGESTION:	If swallowed, and person is conscious, immediately give person large amounts of water. Get medical attention. Never give anything by mouth to an unconscious or convulsing person. Induce vomiting only if instructed by a physician.
NOTE TO PHYSICIANS	If ingested, administer medicinal absorbent charcoal. In case of respiratory difficulty, administer oxygen therapy. Check victim's state of consciousness, breathing and pulse, and administer CPR if indicated. There is no specific antidote to the active ingredients in this product; use symptomatic treatment.

5. FIRE FIGHTING MEASURES

Property	Value	Property	Value
Flash Point (°C):	Not applicable	Burning Rate of Material:	Not applicable
Lower Explosive Limit:	Not applicable	Autoignition Temp.:	Not applicable
Upper Explosive Limit:	Not applicable	Flammability Classification: (defined by 29 CFR 1910.1200)	Not applicable

UNUSUAL FIRE AND EXPLOSION HAZARDS:	None expected.
EXTINGUISHING 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 other suitable dry powder. Avoid breathing fumes from burning material. Fire-fighting personnel should use proper respiratory protection and protective fire suits including self-contained breathing apparatus with a full face-piece operated in pressure-demand or other positive-pressure mode.

6. ACCIDENTAL RELEASE MEASURES

For transportation-related and large spills call CHEMTREC: 1-800-424-9300. For small spills, using protective equipment as prescribed in Section 8, 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 (HEPA) vacuum or wet clean up. Dispose in accordance with Section 13.

7. HANDLING AND STORAGE

HANDLING:	No smoking, eating, or drinking while using this product. Wash hands thoroughly after handling. Minimize free fall of powder and avoid dispersion of dust in air. Contents should be stored in a clean, cool area.
STORAGE:	Contents should be stored in a clean, cool area.
OTHER PRECAUTIONS:	Do not shake clothing, rags or other items to remove dust. Dust should be removed by washing or HEPA vacuuming.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS:	Provide local exhaust ventilation or general dilution ventilation to maintain exposure levels below the PEL and TLV.
EYE / FACE PROTECTION:	Safety glasses with side shields or goggles are recommended. An eye wash fountain should be available within the immediate work area. Contact lenses should not be worn when handling these materials.
SKIN PROTECTION:	Wear impervious gloves and other protective clothing (aprons, coveralls) as appropriate to prevent skin contact when using this product. Wash thoroughly after handling, especially before eating, drinking, or smoking.
RESPIRATORY PROTECTION:	If exposures above the PEL/TLV are possible, use a NIOSH-approved half-face or full-face respirator equipped with High Efficiency Particulate (HEPA) filter cartridges.
GENERAL HYGIENE CONSIDERATIONS:	Do not eat, drink, or smoke while using this product. Wash hands thoroughly after use.

9. PHYSICAL AND CHEMICAL PROPERTIES

Property	**Value**	**Property**	**Value**
Appearance:	Gray powder or solid	*Vapor Density (air = 1):*	Not applicable
Odor:	None	*Boiling Point (°F):*	2870°C (5198°F)
Molecular Weight:	Mixture	*Melting point:*	1495°C (2723°F)
Physical State:	solid	*Specific gravity (g/cc):*	11.0 – 15.5
pH:	Not applicable	*Viscosity (cps):*	Not applicable
Vapor Pressure (mm Hg):	Not applicable	*Decomposition Temperature:*	Unknown
Solubility in Water (20 °C):	Practically insoluble	*Evaporation Rate:*	Not Applicable
Volatiles, Percent by volume:	Not applicable	*Octanol/water partition coefficient:*	Unknown

10. STABILITY AND REACTIVITY

STABILITY	Stable under normal temperatures and pressure
CONDITIONS TO AVOID:	Avoid exposure to heat, sparks, or flame.
MATERIALS TO AVOID:	Acids, bases, strong oxidizers.
HAZARDOUS DECOMPOSITION PRODUCTS:	When heated to decomposition, may produce metal oxides and fumes. Inhalation of high concentrations of metal fumes may cause a condition known as “metal fume fever” which is characterized by flu-like symptoms.
HAZARDOUS POLYMERIZATION:	Will not occur.

11. TOXICOLOGICAL INFORMATION

POTENTIAL EXPOSURE ROUTES:	This product may be encountered through skin contact, eye contact, ingestion, or inhalation of dusts, fumes or powder.

***ACUTE ANIMAL TOXICITY DATA*:**

For Product: The toxicological properties of this product have not been thoroughly investigated.		**For Components:**		
		Tungsten Carbide	Cobalt	Chromium Carbide
Oral LD_{50}	No data	> 2 g/kg (rat)	6.171 g/kg (rat)	No data
Dermal LD_{50}	No data	> 2 g/kg (rabbit)	No data	No data
Inhalation LC_{50}	Similar product: harmful if inhaled	> 5 mg/l (4 hour, rat)	No data	No data
Irritation	No data	Mild eye and skin irritant	Respiratory irritant, skin and resp. sensitizer	No data

SUBCHRONIC/ CHRONIC TOXICITY DATA:	No information for product.
CARCINOGENICITY:	There have been some recent studies of hard metals workers (epidemiology studies) that have reported an association between exposure to hard metals and lung cancer. Because of problems in the designs of these studies, it is not possible to conclusively demonstrate that occupational

	exposure to hard metal dust causes lung cancer in humans. No long-term studies or cancer studies in laboratory animals exposed to hard metal have been conducted. The International Agency for Research on Cancer (IARC) lists cobalt and cobalt compounds as possibly carcinogenic to humans, group 2B.
MUTAGENICITY:	Studies conducted in test tubes with white blood cells (lymphocytes) from humans that have been exposed to hard metal powder suggest that there may be a specific interaction between tungsten carbide and cobalt that may cause damage to DNA molecules within the cell's nucleus. However, when lymphocytes from workers exposed to hard metal dust were examined, no changes in the DNA were found.
REPRODUCTIVE, TERATOGENICITY, OR DEVELOPMENTAL EFFECTS:	This product is not know or reported to cause reproductive or developmental effects
NEUROLOGICAL EFFECTS:	This product is not known or reported to cause neurological effects.
INTERACTIONS WITH OTHER CHEMICALS WHICH ENHANCE TOXICITY:	None known or reported.

12. ECOLOGICAL INFORMATION

ECOTOXICITY:	MOBILITY:	PERSISTENCE/DEGRADABILITY:	BIOACCUMULATION:
No data.	No data.	No data.	No data.

13. DISPOSAL CONSIDERATIONS

Responsibility for proper waste disposal is with the owner of the waste.
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, dispose of all waste product and containers in accordance with local, state, federal, and national regulations.

14. TRANSPORT INFORMATION

DOT/IMO/IATA	Cutting Tool – Not Classifiable or regulated by DOT. Powder Form - May be classifiable or regulated by DOT as a flammable solid or toxic/poisonous substance. If a powder is resold and shipped in the same physical form it was received, appropriate labeling, marking, documenting, and placarding may be needed. Contact Kennametal Corporate EHS Department at (724) 539-5066 for information on powder classification.
PROPER SHIPPING NAME	
HAZARD CLASS	
UN NO.	
PACKING GROUP	
LABEL	
REPORTABLE QUANTITY	None

15. REGULATORY INFORMATION

INVENTORY STATUS

United States (TSCA)	All ingredients are on the inventory or are exempt from listing.
CERCLA:	None
SARA 313:	Cobalt
SARA 312 HAZARD CLASS:	Health: Acute – Yes, Chronic - Yes Fire: None Reactivity: None Release of Pressure: None
SARA 302 EHS LIST:	None of the components of this product are listed.

TPQ = Threshold Planning Quantity; RQ = Reportable Quantity; *No reporting of release is required if the diameter of the pieces of the solid metal released is equal to or exceeds 100 micrometers.

STATE RIGHT-TO-KNOW STATUS

Component	CA Prop. 65*	Michigan	New Jersey	Pennsylvania	Massachusetts
Cobalt	X	X	X	X	X

* "WARNING: This product contains detectable amounts of a chemical(s) known to the State of California to cause cancer and/or birth defects or other reproductive harm."

Canada DSL List: The components of this product are on the DSL or are exempt from reporting under the New Substances Notification Regulations.
IDL: Chromium (III) compounds, n.o.s., Cobalt, Tungsten compounds, n.o.s.
WHMIS: D2B. In the form of a pressed and sintered item, this is a manufactured article and is not a "controlled product" under WHMIS

This product has been classified in accordance with the hazard criteria of the *Controlled Products Regulations* and the MSDS contains all the information required by the *Controlled Products Regulations.*

16. OTHER INFORMATION

REVISIONS:	12/05/03
PREPARED BY:	Kennametal, Inc.
NOTICE:	This information is intended for industrial use only by our customers. Any use by third parties is at their own risk. This MSDS meets the regulatory requirements and standards for U.S. products. It may not meet the requirements in all other locations. Although Kennametal Inc. has attempted to provide current and accurate information herein, Kennametal 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 free powder handling or metallurgical safety booklets write:	Kennametal Inc., MSDS Coordinator, P.O. Box 231, Latrobe, PA 15650
For additional MSDSs or any other information, contact:	Kennametal Corporate Compliance Office, phone 724-539-5747 or FAX: 724-539-5439
For technical information contact:	Corporate EHS, phone 724-539-5445 or fax 724-539-5372
To purchase Kennametal products call:	1-800-446-7738 or visit our website at www.kennametal.com