

MICHIGAN DRILL CORPORATION

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GENERAL MATERIAL SAFETY DATA SHEET

PRODUCT: Cemented Tungsten Carbide and High-Speed Cutting Tools

GENERAL COMMENTS:

We do not consider this product in the form it is sold to constitute a physical or health hazard. Subsequent operations such as heating, cutting or grinding may cause some of the ingredients to change to a form which could affect exposed workers.

MICHIGAN DRILL CORPORATION does not manufacture or formulate any of the steel or carbide materials used in its products. The information set forth herein has been summarized from MSDS supplied to **MICHIGAN DRILL CORPORATION** by its various steel and carbide suppliers.

No threshold limit values (TLV's) exist for cutting tools. TLV may be applicable to constituent elements.

HAZARDOUS INGREDIENTS

Component Elements	CAS NO.	PEL (mg/m ³)	TLV (mg/m ³)	Component Elements	CAS NO.	PEL (mg/m ³)	TLV (mg/m ³)
Carbon (C)	7740-44-0	N/A	3.5	Molybdenum (Mo)	7439-98-7	15.0	10.0
Carbon Black	1333-86-4	3.5	3.5	Nickel (Ni)	7440-02-0	1.0	1
Chromium (Cr) (+3)	7440-47-3	1.0	.05	Silicon (Si)	7440-21-3	5.0	5.0
Chromium Carbide (+3)	7440-47-3	1.0	0.5	Tantalum (Ta)	7440-25-7	5.0	5
Cobalt (Co)	7440-48-4	0.1	0.1	Tungsten (W)	7440-33-7	N/A	5
Copper (Cu)	7440-50-8	0.1	0.1	Tungsten Carbide (WC)	12070-12-1	N/A	5
Iron (Fe) (Fume)	1309-37-1	10.0	5.0	Vanadium (V)	7440-62-2	0.1	.05
Manganese (Mn)	7439-96-5	5.0	5.0	Vanadium Carbide (VC)	1314-62-1	0.1	.05

PHYSICAL DATA:

Appearance and Odor: Various shapes, solid, odorless metal

Boiling Point: N/A

Specific Gravity: (H₂O = 1):2

% Volatiles by Volume: N/A

How Best Monitored: Air Sample

Vapor Density: N/A

Vapor Pressure: N/A

Solubility in Water: Insoluble

FIRE, EXPLOSION AND REACTIVITY DATA:

Flash Point: None

Fire Point: None

Stability: Chemically Stable

Incompatibility: Reacts with strong acids to generate hydrogen gas

Hazardous Decomposition Products: Metallic Oxides

Conditions to Avoid: Avoid generation of airborne dust

HEALTH HAZARD DATA

Primary Routes of Entry:

Inhalation

Remove to fresh air; if condition continues, consult Doctor.

Eye Contact

Flush well with running water to remove particulate; consult Doctor.

Skin Contact

Brush off excess dirt; wash area well with soap and water

Ingestion

Seek medical help if large quantities of material have been ingested.

(Ingestion of significant amounts of metal is unlikely.)

EFFECTS OF EXPOSURE:

No toxic effects would be expected from exposure to the solid form of high-speed or carbide cutting tools. Prolonged, repeated exposure to fumes or dust generated during subsequent operations involving heating, cutting, grinding or welding may or may not cause adverse health effects associated with the listed component elements in excess of OSHA permissible exposure limits established in 29CFR 1910.1200.

POSSIBLE SIGNS AND SYMPTOMS OF EXPOSURE:

Short-Term Exposures: Metallic taste, nausea, tightness of chest, fever, irritation of eyes, nose, throat and skin.

Long-Term Exposure: Some studies would associate one (or more) of the component elements with the potential for neurologic, pulmonary, respiratory, skin or other disease. None of the component elements of these materials have been identified as known or suspected carcinogens by NTP, IARC or OSHA, except chromium and nickel. We believe there are no reliable scientific studies which show that workers using high-speed or carbide cutting tools suffer increased incidence of lung cancer or other disease because of their exposure to the forms of chromium, nickel or other elements in our product.

SPECIAL PROTECTION INFORMATION:

- Ventilation Requirements:** Use general or local exhaust ventilation to keep airborne concentrations of dust and fumes below the TLV. Consult a professional hygienist.
- Personal Protection Equipment:** Always consult a professional hygienist.
- Respiratory Protection:** If fumes, misting or dust conditions occur, consult a professional hygienist. Provide NIOSH approved respirators.
- Eye Protection:** Safety glasses should always be worn when grinding or cutting, face shields should be worn when welding or burning.
- Gloves:** Gloves and barrier creams may be necessary to prevent skin sensitization and dermatitis.
- Other Clothing or Equipment:** As required.

INDUSTRY CHEMICAL ANALYSIS DATA (Percent by Weight):

HIGH SPEED STEEL TOOLS

AISI	C	Co	Cr	Cu	Fe	Mn	Mo	Ni	Si	V	W
M-1	<1.0	<1.0	<5.0	—	Bal.	<1.0	<10.0	<1.0	<1.0	<2.0	<3.0
M-2	<1.0	<1.0	<5.0	<1.0	Bal.	<1.0	<6.0	<1.0	<1.0	<3.0	<7.0
M-3 Class 1	<2.0	—	<5.0	—	Bal.	<1.0	<7.0	—	<1.0	<3.0	<7.0
M-3 Class 2	<2.0	<1.0	<5.0	<1.0	Bal.	<1.0	<7.0	<1.0	<1.0	<4.0	<7.0
M-4	<2.0	—	<5.0	—	Bal.	<1.0	<5.0	—	<1.0	<5.0	<7.0
M-7	<2.0	<1.0	<5.0	—	Bal.	<1.0	<10.0	<1.0	<1.0	<3.0	<3.0
M-10	<2.0	<1.0	<5.0	<1.0	Bal.	<1.0	<9.0	<1.0	<1.0	<3.0	<2.0
M-41	<2.0	<6.0	<5.0	—	Bal.	<1.0	<5.0	<2.0	<1.0	<3.0	<7.0
M-42	<2.0	<9.0	<5.0	<1.0	Bal.	<1.0	<10.0	<1.0	<1.0	<2.0	<3.0
M-48	<2.0	<10.0	<4.0	—	Bal.	<1.0	<6.0	—	<1.0	<4.0	<4.0
M-62	<2.0	—	<4.0	—	Bal.	<1.0	<11.0	—	<1.0	<3.0	<3.0
T-15	<2.0	<6.0	<5.0	—	Bal.	<1.0	<1.0	—	<1.0	<6.0	<6.0
A-2	<1.5	—	<6.0	—	Bal.	<1.0	<1.5	—	<1.0	<1.0	—
D-2	<2.0	—	<13.0	—	Bal.	<1.0	<1.0	—	<1.0	<1.0	—
35 Spring Steel*	<1.0	—	<1.0	—	Bal.	<1.0	—	<3.0	<1.0	—	—
TC*	<1.0	—	<1.0	—	Bal.	<1.0	—	<2.0	<1.0	—	—

SOLID OR BRAZED TUNGSTEN CARBIDE TOOLS

Co	Cr	Tantalum Carbide (TaC)	Tungsten Carbide (WC)	Chromium Carbide
3-30	0-5	0-50	56-97	0-6

*Not AISI Steel Classification.

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