

SAFETY DATA SHEET

1. Chemical and Manufacturer Information

1.1 Product Name

Cemented Carbide, Coated Cemented Carbide and Cemented Carbide Tools

1.2 Company Information

Company Name : Sumitomo Electric Hardmetal Corp.
 Address : 1-1-1, Koya-kita, Itami, Hyogo, 664-0016 Japan
 Phone Number : +81-72-771-0555
 Fax Number : +81-72-773-1723
 Emergency Phone Number : +81-72-771-0555 (Environmental administrator)

1.3 Recommended Use and Restrictions on Use of the Cemented Carbide

Cutting tools mainly for metallic materials, wear-resistant tools for plastic forming process, tools for macadam, civil engineering, and urban development, etc.

1.4 Attention to the Phase/State of the Cemented Carbide

- Cemented Carbide as solid state like cutting tools is chemically stable and safe at explosive, flammable, combustible, pyrophoric, water-reactive, and oxidizability under normal environment.
- Cemented Carbide is safe for use as the cutting tools (grinding, machining, rolling for metals) under normal condition.
- This SDS informs about the dust, fume or vapor which occur from Cemented Carbide producing process such as raw material powder handling and grinding.

2. Hazards Identification


2.1 GHS classification

GHS classification for the hazards of cobalt alone in below,
 (When cobalt is included as ingredients of Cemented Carbide.)

Health Hazard	<ul style="list-style-type: none"> • Respiratory sensitization • Skin sensitization • Carcinogenicity • Reproductive toxicity • Specific target organ toxicity (Single exposure) • Specific target organ toxicity (Repeated exposure) 	Category1 Category1 Category2 Category2 Category3 (Respiratory tract irritation) Category1 (Respiratory)
Environmental Hazard:	<ul style="list-style-type: none"> • Hazardous to the aquatic environment 	Category4

※ Other hazards and harmful effects which are not listed are unclassifiable or non-applicable by GHS.

2.2 GHS label element

	The dust, fume or vapor which occur from Cemented Carbide producing process.	Cemented carbide, Cemented carbide tools
Hazard Pictograms :		Not applicable
Signal Words :	Danger	Not applicable
Hazard Statements :	<ul style="list-style-type: none"> • Risk of causing allergies, asthma or breathing difficulties if inhaled. • Risk of causing an allergic skin reaction. • May cause cancer. • May cause adverse effects on fertility or the unborn child. • Risk of respiratory irritation. • Cause of respiratory failure due to long-term or repetitive exposure. • May be harmful to aquatic life due to long-term effects 	Not applicable
Precautionary Statements :	<p>【Prevention】</p> <ul style="list-style-type: none"> • Do not handle until all safety precautions have been read and understood. • Use appropriate personal protection and ventilation system keeping away from exposure. • Wear suitable protective gloves. • When insufficient ventilation, wear respirator as required. • Do not breathe dust, fume or vapor. • Do not eat, drink or smoke in handling area. • Wash skin thoroughly after handling. • Do not release into the environment. <p>【Responses】</p> <ul style="list-style-type: none"> • If inhaled, move to fresh air and take a rest with posture easy to breathe. • If respiratory symptoms occurs, contact a doctor. • When feeling ill, get medical advice/attention. • Take off contaminated clothing and wash before reuse. • If on skin, rinse away immediately with a large amount of water and soap. • If skin irritation occurs, contact a doctor and get medical advice/attention. • If exposed or concerned, get medical advice/attention. • If dust is in eyes, immediately wash away with clean water (remove the contact lenses if possible). If irritation persists, get medical advice/attention. • If a large amount of dust is swallowed, get medical advice/attention after ingesting plenty of water to dilute. 	<p>【Prevention】</p> <ul style="list-style-type: none"> • Do not handle until all safety precautions have been read and understood.
	<p>【Disposal】</p> <ul style="list-style-type: none"> • Dispose of contents/container to an approved waste disposal plant under the laws. 	

3. Composition / Information on Ingredients

•Cemented Carbide can be coated with the following materials:

AlN, Al₂O₃, (Al,Ti)N, CrN, Ti(B,C,N), TiC, (Ti,Zr)N, WC, (Al,Si,Ti,Cr)(C,N)

•Distinction of a single product or mixture : Mixture (Alloy)

Main ingredients and Contents

Material	Chemical Formula	CAS No.	Classification No. by PRTR Law	Enforcement Serial No. by Industrial Safety and Health Laws	Weight % of ingredients
Tungsten Carbide	WC	12070-12-1	Not applicable	Not applicable	55-95
Tantalum Carbide	TaC	12070-06-3	Not applicable	Not applicable	0-20
Niobium Carbide	NbC	12069-94-2	Not applicable	Not applicable	0-20
Titanium Carbide	TiC	12070-08-5	Not applicable	Not applicable	0-20
Titanium Nitride	TiN	25583-20-4	Not applicable	Not applicable	0-5
Vanadium Carbide	VC	12070-10-9	Class 1-No.321 Attached	Not applicable	0-5
Cobalt	Co	7440-48-4	Class 1-No.132 Attached	No. 9-172 Table	0-30
Nickel	Ni	7440-02-0	Class 1-No.308 Attached	No. 9-418 Table	0-30
Chromium	Cr	7440-47-3	Class 1-No.87 Attached	No.9-142 Table	0-5

*For the details regarding the content of the designated chemical material such as cobalt, nickel, chromium, and vanadium carbide (effective digit: 2), please contact to the above supplier.

4. Emergency and First Aid Procedures

4.1 Inhalation

If high concentration of dust is inhaled or the worker exhibits trouble breathing (cough, pant, etc), remove to fresh air. If breathing is difficult, administer oxygen.

If breathing has stopped, try artificial respiration. Seek immediate medical attention.

If irritation or a rash is continuous for a long period , seek medical attention.

4.2 Skin Contact

When dust contacts the skin, remove the contaminated clothes and clean the skin with soap and water. If irritation or a rash is continuous for a long period , seek medical attention.

4.3 Eye Contact

When dust gets in eye flush with running water. If the irritation persists , seek medical attention.

4.4 Ingestion

When a large volume of dust is swallowed drink plenty of water to dilute and seek immediate medical attention.

5. Fire Procedures

5.1 Fire Extinguisher

When ignition of dust occurs , use dry sand, expanded vermiculite, dilatable perlite, ABC type (for general, oil and electricity fire) powder fire extinguisher or water, but when the dust contains light metals for example magnesium or aluminum, do not use water.

5.2 Unusual Fire and Explosion

If dust is in a special condition, for example it has a very small particle size and is mixed with low flash point grinding oil, it might spontaneously ignite. If this dust in this condition is then sprayed in the air it might reach the explosion point.

5.3 Fire fighter's protection

Use dust-proof mask or self contained breathing apparatus.

6. Spill and Leak Procedures

6.1 Attention to the Human Body

Clean-up personnel should wear personal protective equipment including respiratory protection which is appropriate for the magnitude of exposure.

6.2 Attention to the Environment

Dust must be treated as an industrial waste and must not leak to the water system.

6.3 Removal Procedures

For removal of dust, isolate area and do not walk through else material will get scattered.

Remove dust using a vacuum equipped with a filter sufficient to remove metal dust and prevent their circulation (a high efficiency particulate air (HEPA) filter is recommended).

If an appropriate vacuum is unavailable, use mist, a wet dust mop or another wet clean-up method to remove the dust.

7. Handling and Storage

7.1 Handling

Cemented carbide is stable thus there is almost no effect to the human health, but long time or repetitive contact to dust or grinding liquid which contains cobalt and nickel, may damage the skin. When grinding or machining cemented carbides cobalt and nickel contained dust may be dispersed, use extraction to minimize the dust exposed to workers. Remove ground sludge as well as dust. Since the specific gravity of cemented carbide is large, treat large products and large quantities as heavy objects. Wash hands thoroughly before eating, drinking and smoking. Do not eat, drink and smoke in the cemented carbide handling area. Have a periodical medical examination.

7.2. Storage

Avoid drastic changes of temperature and high humidity.

8. Exposure Controls and Personal Protection

Use a dust protective mask and a respirator, and set up local exhaust ventilation to prevent airborne dust which exceeds the permissible level on the following table. It is to be noted that management concentration of the cobalt (and its inorganic compounds) is to be 0.02mg/m³ in accordance with the working environment assessment standard by Japanese Minister of Health, Labour and Welfare under the paragraph (2), Article 65-2 of the Industrial Safety and Health Act in Japan.

In addition, cobalt (and its inorganic compounds) in the storage or handling, and that to take the necessary action conforming to the Ordinance on Prevention of Hazards due to Specified Chemical Substances.

8.1 Permissible exposure limit in working environments (reference value)

Ingredients	Chemical formula	*OSHA PEL	**ACGIH TLV	***JSOH OLEs
		mg/m ³ (Concentration of metal dust particles)	mg/m ³ (Concentration of metal dust particles)	mg/m ³ (Concentration of metal dust particles)
Tungsten Carbide	WC	N/A	5 as (W)	****N/A
Tantalum Carbide	TaC	5 as (Ta)	5 as (W)	N/A
Niobium Carbide	NbC	N/A	N/A	N/A
Titanium Carbide	TiC	N/A	N/A	N/A
Titanium Nitride	TiN	N/A	N/A	N/A
Vanadium Carbide	VC	N/A	N/A	N/A
Cobalt	Co	0.1	0.02	0.05
Nickel	Ni	1.0	1.5	1.0
Chromium	Cr	1.0	0.5	0.5

*OSHA: Occupational Safety and Health Administration U.S. Department PEL: Permissible Exposure Limit.

**ACGIH: American Conference of Governmental Industrial Hygienists Inc. TLV: Threshold Limit Value

***JSOH: Japan Society for Occupational Health

****N/A : Not Applicable

8.2 Respiratory protection

Wear respiratory protective equipment or dust mask for protection against dust.

8.3 Hands protection

Wear protective gloves for protection against dust.

8.4 Eye protection

Wear protective glasses or chemical safety goggles for protection against dust.

8.5 Skin and body protection

Avoid direct contact of dust with skins.

In order to remove attached dust, do not shake off clothes or pieces of cloth, but be sure to remove dust by laundering or absorbing with a vacuum cleaner with suitable filters. Change contaminated clothes to clean clothes.

8.6 Hygiene Measure

Wash skin thoroughly after handling.

9. Physical and Chemical Properties

Appearance:	Dark gray color
Odor:	Odorless
pH:	No data available
Melting Point:	No data available
Boiling Point:	No data available
Flash Point:	No data available
Vapor Pressure:	No data available
Specific Gravity:	11.0 - 15.5
Solubility:	Insoluble

*The color can change with coating materials.

10. Stability and Reactivity

10.1 Stability

This product is stable under normal use conditions.

10.2 Conditions to be avoided

Oxidizing substances (Hydrogen peroxide, Nitric acid, Ammonium nitrate, Nitrogen dioxide, etc.)
Others (Hydrazine nitrate, Acetylene, etc.)

10.3 Hazardous and harmful decomposition products

None

*The each metallic ingredients (cobalt, nickel and chromium) for composing the cemented carbide has the following information about stability and reactivity under specific conditions.

Stability and reactivity of cobalt alone in below,

(When cobalt is included as ingredients of Cemented Carbide.)

Stability:

Stable to heat and contact with water

Ignite spontaneously in air

Hazardous reactions:

It reacts with strong oxidizing agents

It reacts violently with oxygen, and it poses a risk of fire or explosion

It reacts violently with acid to generate hydrogen

Conditions to avoid:

Contact with incompatible materials

Incompatible materials:

Strong oxidizing agents, acid

Hazardous decomposition products:

By combustion, cobalt oxide and fumes of cobalt oxide may occur

11. Toxicological Information

11.1 Acute Toxicity

No data available on Cemented Carbide.

11.2 Skin Corrosion / Irritation

No data available on Cemented Carbide.

11.3 Serious Eye Damage / Irritation

No data available on Cemented Carbide.

11.4 Respiratory or Skin Sensitization

No data available on Cemented Carbide.

11.5 Germ Cell Mutagenicity

No data available on Cemented Carbide.

11.6 Carcinogenicity

Group 2A on IARC, as cobalt powder coexisting with tungsten carbide powder.

Suspected to be carcinogenic in humans (References: 1)

11.7 Reproductive Toxicity

No data available on Cemented Carbide.

11.8 Specific Target Organ / Systemic Toxicity (Single Exposure)

No data available on Cemented Carbide.

11.9 Specific Target Organ / Systemic Toxicity (Repeated Exposure)

No data available on Cemented Carbide.

11.10 Aspiration Hazard

No data available on Cemented Carbide.

12. Ecological Information

12.1 Mobility

It moves in dust form, however it has high specific gravity then it has tendency to be piled up.

12.2 Persistence / Degradability

There has been no evidence of persistence for Cemented Carbide.

12.3 Bioaccumulation

There has been no evidence of bioaccumulation for Cemented Carbide.

12.4 Environmental impacts / Ecotoxicity

There has been no evidence of ecotoxicity for Cemented Carbide.

13. Disposal Consideration

Method for safe and environmental preferred disposal :

The main materials, such as tungsten and cobalt, are rare metals, and should be collected and recycled.

In the case of disposal, it must be handled, based on Waste Disposal and Public Cleaning Law. (Domestic Law)

14. Transport Information

UN Number:	Not applicable
UN Hazard Class:	Not applicable
Marine Pollutant:	Not applicable

*When transporting a powder of metallic ingredients (cobalt, nickel) for composing the Cemented Carbide, there is a possibility that it is necessary to take appropriate action in accordance with the relevant provisions established by IMO (International Maritime Organization), ICAO (International Civil Aviation Organization), IATA (International Air Transport Association).

15. Regulatory Information (Japanese Applicable Law)

▪ Law for Pollutant Release and Transfer Register (PRTR)

Vanadium carbide : “Class 1 designated chemical substances”, Cabinet Order No.321

Cobalt : “Class 1 designated chemical substances”, Cabinet Order No.132

Nickel : “Class 1 designated chemical substances”, Cabinet OrderNo.308

Chromium : “Class 1 designated chemical substances”, Cabinet OrderNo.87

▪ Occupational Safety & Health Administration Law.

Cobalt: The substances are defined in the Article 57-2 of the Act, and the cobalt is listed by No.172 in Appended Table9 in the Article 18-2 of the Enforcement Order as “Dangerous or Harmful Substances to be notified their names, etc.”

Article 2, Paragraph 1, Items 2 and 5 of Ordinance on Prevention of Hazards due to Specified Chemical Substance, Specified chemical substance class 2, Management class 2.

When the content of cobalt and cobalt oxide is less than 1%, the Ordinance on Prevention of Hazards due to Specified Chemical Substance is not covered.

Nickel: The substances are defined in the Article 57-2 of the Act, and the nickel is listed by No.418 in Appended Table9 in the Article 18-2 of the Enforcement Order as “Dangerous or Harmful Substances to be notified their names, etc.”

Chromium: The substances are defined in the Article 57-2 of the Act, and the chromium is listed by No.142in Appended Table9 in the Article 18-2 of the Enforcement Order as “Dangerous or Harmful Substances to be notified their names, etc.”

16. Other Information

16.1 Other hazard and toxicity information

The following cautions are required about the dust which occur from Cemented Carbide producing process.

- Dust can cause irritation of the nose, mouth, throat, eye mucosa, upper respiratory tract and lungs when inhaled.Symptoms of overexposure include allergic dermatitis, productive cough, wheezing, shortness of breath, and chest tightness, etc.
- Ingestion of the dust containing high levels of cobalt may cause damage of the blood, heart, thyroid gland and spleen. (References: 2)
- Recent studies indicate that the repeated inhalation or long term contact of cobalt or nickel or chromium metal may affect the skin, respiratory organs, heart, etc. (References: from 3 to 6)

Although there is no carcinogenic knowledge about cemented carbide, there is the following knowledge about a raw powder, and composition metal component.

•Cobalt metal with tungsten carbide:

IARC Group 2A : probably carcinogenic to humans (Reference 6)

•Metallic Cobalt

ACGIH Group A3 : carcinogenic in animals, but the relevance to humans is unknown

IARC Group 2B : possibly carcinogenic to humans

JSOH Group 2B : possibly carcinogenic to humans

(the substance whose evidence is not comparatively enough)

•Metallic Nickel

ACGIH Group A5 : not suspected as a human carcinogen

IARC Group 2B : possibly carcinogenic to humans

JSOH Group 2B : possibly carcinogenic to humans

(the substance whose evidence is not comparatively enough)

•Metallic Chromium

IARC Group 3 : not classifiable as to its carcinogenicity to humans

*ACGIH: American Conference of Governmental Industrial Hygienists Inc.

*IARC: International Agency for Research on Cancer

*JSOH: Japan Society for Occupational Health

Although there is no knowledge of environmental impact about a cemented carbide, there is the following knowledge about composition metal component.

Cobalt and chromium may be potentially hazardous to the environment. Particular attention is required regarding the effect to the aquatic organism.

16.2 Notes on the following descriptions

The details in this SDS have been based on our best investigation and evidences.

The information may be revised according to new evidences, test etc., however, the accuracy and safety of the information are not a guaranteed value.

All chemical agents may contain unknown harmful substances: therefore, the companies and operators, using this SDS, are requested to take appropriate actions according to their own conditions on their own responsibility.

- * Homepage of Ministry of Economy, Trade & Industry : <http://www.meti.go.jp/>
- * Homepage of Ministry of Environment : <http://www.env.go.jp/>
- * Homepage of Ministry of Health, Labor & Welfare : <http://www.mhlw.go.jp/>
- * IARC (International Agency for Research on Cancer) : <http://monographs.iarc.fr/>
- * Supplier of ICSC Cards : <http://www.nihs.go.jp/ICSC/>
- * National Institute of Technology and Evaluation : <http://www.safe.nite.go.jp/ghs/list.html>

16.3 Literature reference

- 1) IARC Monographs on the Evaluation of Calcinogenic Risks to Humans, vol.86 (2006).
- 2) Food & Drug Research Laboratories, Study No.8005B (4.11.84).
- 3) T. Shirakawa et al., Chest.95.29 (1989).
- 4) International Chemical Safety Cards (cobalt, chromium, nickel).
- 5) Danger and hazardous property handbook of a chemical substance (Japan Industrial Safety & Health Association).
- 6) A.O.Bech et al., Brit.J.Ind.,19,239 (1962).