Safety Data Sheet (SDS)

Established Date: 14/Jun/2018
Revised Date: 25/Dec/2023

1. Identification of the Substance and of the Company

Product Identifier: PCD (polycrystalline diamond) and Cemented Carbide base metal (hereinafter referred to as "PCD/Cemented Carbide")

Supplier Information:

Company Name:	OSG Corporation
Address:	3-22 Honnogahara Toyokawa-City Aichi-Pref. 442-8543, Japan
Contact Department:	Quality Assurance Dept
Phone Number:	(81) 536-25-1315 (International Dept.)
FAX Number:	(81) 536-25-1310
Emergency Phone Number:	(81) 536-25-1315 (International Dept.)

Recommended Use and Restrictions on Use of the PCD/Cemented Carbide:

Cutting and drilling tools for metallic materials

Restrictions on Use of the PCD/Cemented Carbide:

Do not use for other than the specified purpose

Attention to the Phase/State of the PCD/Cemented Carbide:

- PCD/Cemented Carbide as a solid state is chemically stable and safe from explosives, flammable, combustible, pyrophoric, water reactive, and oxidizable in a normal environment.
- PCD/Cemented Carbide is safe for use as cutting tools (grinding, machining, rolling for metals) under normal conditions.
- This SDS informs about the dust, fumes or vapors which occur from PCD/Cemented Carbide producing process such as raw material powder handling and grinding.

2. Hazard Statements:

The GHS Classification

Some data (such as the burning rate test data, etc.) for the dust, fumes or vapors which occur from PCD/Cemented Carbide producing process are unavailable. Therefore, they are not classified by GHS.

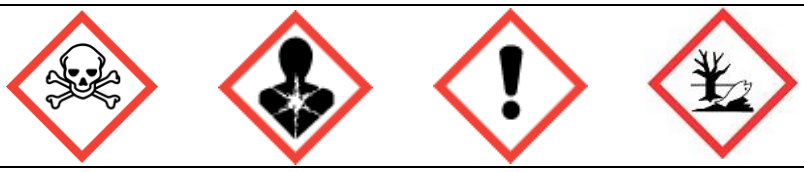
The hazards of the metal ingredient (cobalt) that makes up the PCD/Cemented Carbide are classified as follows. In addition, other hazards and harmful effects (health, environmental, physical and chemical) that are not listed are not applicable or classifiable under GHS.

- GHS classification for the hazards of cobalt alone is below.
  (When cobalt is included as a metal ingredient of PCD/Cemented Carbide)

Health Hazard:	• Acute toxicity (oral)	Category 4
	• Acute toxicity (inhalation: dust, mist)	Category 1
	• Serious eye damage/Eye irritation	Category 2B
	• Respiratory sensitization	Category 1A
	• Skin sensitization	Category 1A
	• Carcinogenicity	Category 2
	• Reproductive toxicity	Category 1B
	• Specific target organ toxicity (single exposure)	Category 1(respiratory system)
	• Specific target organ toxicity (repeated exposure)	Category 1(respiratory system, heart, thyroid, blood system, reproductive system (male))
Environmental Hazard:	• Hazardous to the aquatic environment – short-term (acute)	Category 1
	• Hazardous to the aquatic environment – long-term (chronic)	Category 1

GHS Label Elements

GHS label elements for the metal ingredient (cobalt) that makes up the PCD/Cemented Carbide are as follows.

	Cobalt
Hazard Pictograms:	
Signal Words:	Danger
Hazard Statements:	• Harmful if swallowed • Life threatening if inhaled • Eye irritation • 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 • Organ disorder (respiratory system) • Organ disorder due to long-term or repeated exposure (respiratory system, heart, thyroid, blood system, reproductive system (male)) • Very toxic to aquatic life due to long-lasting effects
Precautionary Statements:	【Prevention】 • Obtain safety instructions* before use • 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 • If ventilation is inadequate, wear a suitable respirator • Do not breathe dust, fumes or vapors • Do not eat, drink or smoke in handling area • Wash skin thoroughly after handling • Do not release into the environment 【Responses】 • If inhaled, move to fresh air and take a rest with posture easy to breathe • If respiratory symptoms occur, 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 【Storage】 • Avoid sudden changes of temperature and high humidity for storage 【Disposal】 • Contact a specialized waste disposal company licensed by the governor

*For safety instructions, refer to the Japan Cutting & Wear-resistant Tool Association website (http://www.jta-tool.jp/)

3. Composition/Information on Ingredient

- Distinction between substance and mixture: Mixture (alloy)
- Chemical name or general name: PCD/Cemented Carbide
- Ingredients and concentration or concentration range (composition) of the PCD/Cemented Carbide

Ingredient	Chemical Formula	CAS No	PRTR Law No	Official Number of Industrial Safety and Health Law	Composition mass%
【PCD】					
Synthetic diamond	C	7782-40-3		n/a	0 to 30
【Cemented Carbide base metal】					
Tungsten carbide	WC	12070-12-1		n/a	45 to 80
Cobalt	Co	7440-48-4	132	Appendix 9-172	0 to 30

※ For the details regarding the content of the designated chemical material (cobalt; effective digit: 2), please contact the responsible department.

※ Even if the PCD/Cemented Carbide does not contain cobalt as an active ingredient, it may contain cobalt as an impurity.

4. First-Aid Measures

If Inhaled

- If the high concentration of dust is inhaled or respiratory symptoms (coughs, gasping, shortness of breath, etc.) are experienced, move to fresh air and take a rest with posture easy to breathe. If breathing difficulties occur, administer oxygen inhalation. If breathing has stopped, immediately administer artificial respiration and get medical advice/attention.
- If irritation or rash persists, get medical advice/attention.

If on Skin

- If dust is contacted with skin, take off contaminated clothing and rinse the affected area with soapy water thoroughly. If irritation or rash persists, get medical advice/attention.

If in Eyes

- 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 Swallowed

- If a large amount of dust is swallowed, get medical advice/attention after ingesting plenty of water to dilute.

5. Fire-Fighting Measures

Suitable Extinguishing Media and Unsuitable Extinguishing Media

- To extinguish dust fire, use dry sand, expanded vermiculite, dilatable perlite, ABC type (general, oil, electric fire) powder extinguishers or water (no water allowed for the dust containing cut powders of light metal such as magnesium and aluminum).

Special Protective Equipment and Emergency Procedures for Fire-Fighters

- In fighting a fire, wear a protective clothing, dust-proof respirator or respiratory protective equipment.

6. Accidental Release Measures

Personal Precautions, Protective Equipment, and Emergency Procedures

- It is recommended that someone who cleans dust should wear clothing and respiratory protective equipment to minimize exposure.

Environmental Precautions

- Dispose of dust as industrial waste and prevent release in water systems.

Containment and Cleanup Methods and Equipment

- If there is dust which occurs from PCD/Cemented Carbide producing process, isolate the area and remove the dust with a cleaner equipped with a filter which can take up fine particles very efficiently. If appropriate removing methods are not available, wet with water mist or wet floor mop to remove dust.

7. Handling and Storage

Handling

■ **Technical Measures**

- If the disperse of dust containing cobalt is concerned, provide local exhaust ventilation and use personal protective equipment to minimize exposure to human body.

■ **Precautions for Safe Handling**

- Obtain safety instructions before use.
- Do not handle until all safety precautions have been read and understood.

■ **Contact Avoidance**

- Take measures described in "Exposure Controls/Personal Protection."
- Do not breathe dust, fumes or vapors.
- Do not eat, drink or smoke in handling area.

■ **Hygiene Measures**

- Wash skin thoroughly after handling.
- Do not release into the environment.

Storage

■ **Conditions for Safe Storage**

- Avoid sudden changes of temperature and high humidity for storage.
- If storing fine powder, dust, and swarf generated by cutting or polishing, cover them with a cover to prevent dispersal.

■ **Materials for Safe Container**

- Use materials meeting the specific gravity of PCD/Cemented Carbide.

8. Exposure Controls/Personal Protection

Exposure Prevention

- Permissible concentration in working environment (reference value)

Ingredient	Chemical Formula	OSHA* PEL* mg/m^3	ACGIH* TLV* mg/m^3	Japan Society for Occupational Health Exposure Limit* mg/m^3
【PCD】				
Synthetic diamond	C	N/A	N/A	N/A
【Cemented Carbide base metal】				
Tungsten carbide	WC	5 (as W)	5 (as W)	N/A
Cobalt	Co	0.1	0.02	0.05

*OSHA: Occupational Safety & Health Administration U.S. Department
*PEL: Permissible Exposure Limit
*ACGIH: American Conference of Governmental Industrial Hygienists Inc.
*TLV: Threshold Limit Value
*Exposure Limit: If processing such as polishing and cutting that generates dust, for ingredients with no indicated value, refer to the exposure limit of the Japan Society for Occupational Health
*N/A: Not Applicable

- Facility measures

Provide local exhaust ventilation so that dust in the air may not exceed the exposure limits in the above table.

It is to be noted that the management concentration of cobalt (and its inorganic compounds) is to be 0.02 mg/m^3 in accordance with the working environment assessment standard by the Japanese Minister of Health, Labour and Welfare under paragraph (2), Article 65-2 of the Industrial Safety and Health Act in Japan.

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

Protection Measures

- Respiratory Protection: Dust-proof respirators and respiratory protective equipment are recommended.
- Hand Protection: Protective gloves for dust are recommended.
- Eye/Face Protection: Eye/Face protections for dust are recommended.
- Skin/Body Protection: Avoid direct skin contact.
  Clean up deposited dust on clothing, rags, etc. by washing or absorbing it with suitable filters, but not by whisking it off. Clothing exposed to dust should be replaced with new clothing.

9. Physical and Chemical Properties

Physical State:	Solid state
Color:	PCD: Black and gray metallic color Cemented Carbide: Dark gray color
pH:	No data available
Odor:	Odorless
Melting/Freezing Point:	No data available
Boiling or Initial Boiling Point and Boiling Range:	No data available
Flash Point:	No data available
Vapor Pressure:	No data available
Vapor Density:	No data available
Kinematic Viscosity:	No data available
Solubility:	Insoluble
Specific Gravity (relative density)	No data available

10. Stability and Reactivity

A grain of dust which occurs from PCD/Cemented Carbide producing process is very fine and under the specific conditions in which the dust is mixed with grinding oil with low flash point, it is possible to become pyrophoric. If dust under very flammable conditions is dispersed in the air, it is possible to explode.

The metal ingredient (cobalt) for composing the PCD/Cemented Carbide has the following information about stability and reactivity under specific conditions.

- Stability and reactivity of cobalt alone is below.
  (When cobalt is included as a metal ingredient of PCD/Cemented Carbide)

Reactivity, chemical stability:	• Stable to heat and contact with water. • Ignites spontaneously in air.
Hazardous reactions:	• Reacts with strong oxidizing agents. • Reacts violently with oxygen, posing a risk of fire or explosion. • 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

Acute Toxicity:	No data available on PCD/Cemented Carbide
Skin Corrosion/Irritation:	No data available on PCD/Cemented Carbide
Serious eye damage/Eye irritation:	No data available on PCD/Cemented Carbide
Respiratory or Skin Sensitization:	No data available on PCD/Cemented Carbide
Germ Cell Mutagenicity:	No data available on PCD/Cemented Carbide
Carcinogenicity:	Cobalt powder coexisting with tungsten carbide is IARC Group 2A. Suspected to be a human carcinogen. (Ref.1)
Reproductive Toxicity:	No data available on PCD/Cemented Carbide
Specific Target Organ/Systemic Toxicity (Single Exposure):	No data available on PCD/Cemented Carbide
Specific Target Organ/Systemic Toxicity (Repeated Exposure):	No data available on PCD/Cemented Carbide
Respirator Hazard:	No data available on PCD/Cemented Carbide

12. Ecological Information

Acute Aquatic Hazard

- No knowledge available on PCD/Cemented Carbide

Chronic Aquatic Hazard

- No knowledge available on PCD/Cemented Carbide

Mobility

- No knowledge available on PCD/Cemented Carbide

13. Disposal Considerations

Safe and environmentally desirable disposal or recycle method

- The main ingredients such as tungsten carbide and cobalt are rare metals, so it is desirable to collect and recycle them.
- For disposal, comply with the applicable laws and regulations regarding industrial waste.

14. Transport Information

International Regulations

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

※ When transporting a powder of a metal ingredient (cobalt) for composing the PCD/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).

Domestic Regulations

Land Regulatory Information:	In accordance with the Fire Service Act/ the Road Act
Marine Transportation Information:	In accordance with the Ship Safety Act/ the Act on Port Regulations
Marine Pollutant:	Not applicable
Aviation Transportation Information：	In accordance with the Civil Aeronautics Act

※ When transporting a powder of a metal ingredient (cobalt) for composing the PCD/Cemented Carbide, there is a possibility that it is necessary to take appropriate action in accordance with the relevant provisions of the Ship Safety Act and the Civil Aeronautics Act.

Special Safety Measures for Transportation and Transportation Method

When transporting the dust which occurs from PCD/Cemented Carbide raw materials and producing process, make sure that there is no damage or corrosion or leakage of the container, to ensure implementation of the prevention of collapse of cargo.

15. Regulatory Information

Name and Information of Applicable Regulatory

- Law for Pollutant Release and Transfer Register (PRTR)

  Cobalt — Class 1 designated chemical substance No. 156

- Industrial Safety and Health Law, Ordinance on Prevention of Hazards due to Specified Chemical Substances

  Cobalt — The substance is defined in Article 57-2 of the Act, and is listed as No.172 in Appended Table 9 in Article 18-2 of the Enforcement Order as Dangerous or Harmful Substances to be notified of 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.

16. Other Information

Other Hazardous Information

- If a large amount of dust containing cobalt is inhaled, blood, heart, thyroid gland, and spleen disorders may result. (Ref.2)
- It is reported that repeated or prolonged contact with cobalt may affect skin, respiratory organs, heart, etc. (Ref.3 to 6)
- The carcinogenicity of the metal ingredients is as follows.

Cobalt metal	ACGIH	A3: Confirmed to be carcinogenic to animals, but relevance to humans is unknown
	IARC	2B: Possibly carcinogenic to humans
	Japan Society for Occupational Health	2B: The substance has been determined to be possibly carcinogenic to humans (with relatively insufficient evidence)

Disclaimer

The contents of this SDS are based on material and information available as of today and may be revised due to knowledge newly obtained. The values of concentration, physical/chemical properties are not guaranteed. In addition, the precautions described herein apply only to normal uses, and thus safety cannot be guaranteed.

Reference URL

- Ministry of Economy, Trade and Industry: http://www.meti.go.jp/
- Ministry of the Environment: http://www.env.go.jp/
- Ministry of Health, Labour and Welfare: http://www.mhlw.go.jp/
- Japan Industrial Safety and Health Association: http://www.jaish.gr.jp/
- International Agency for Research on Cancer: http://monographs.iarc.fr/
- International Chemical Safety Cards: http://www.nihs.go.jp/ICSC/
- National Institute of Technology and Evaluation: http://www.safe.nite.go.jp/ghs/list.html

Reference Documents

(1) IARC Monographs on the Evaluation of Carcinogenic 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) The Guide to Chemical Hazards (edited by Japan Industrial Safety & Health Association)
(6) A. O. Bech et al., Brit. J. Ind., 19, 239 (1962).