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# MATERIAL SAFETY DATA SHEET

## 1. Chemical and Manufacturer Information

### 1.1 Product Name

CVD Single Crystal Diamond

### 1.2 Company Information


Company Name : Sumitomo Electric Hardmetal Corp.
Address : 1-1-1, Koya-kita, Itami, Hyogo, 664-0016 Japan
Department : Super Hard Materials Manufacturing Department
Phone No. : +81-72-771-0535
Fax No. : +81-72-772-5152


### 1.3 Chemical Family : Diamond

## 2. Hazards Identification

### 2.1 Danger from Fire

Diamond is non flammable when it is in a solid state, thus there is no chance to be a cause of fire. However dust from grinding has the possibility of spontaneous ignition or explosion. Flash point, flammable limits and explosion limits have not been found.

### 2.2 Toxicity

There is the possibility of irritation when dust from grinding contacts the skin or eyes . It is reported that repetition or long periods in contact with of, may influence the to skin, respiratory organs, heart, etc.

### 2.3 Environmental Impact

Not applicable

### 2.4 GHS classification

Not applicable

### 2.5 GHS label element

Not applicable

## 3. Composition / Information on Ingredients

※ Distinction of a single product or mixture : Single product (CVD Single Crystal Diamond)

**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 |
|---|---|---|---|---|---|
| Diamond | C | 7782-40-3 | Not applicable | Not applicable | 100 |

* Please contact our department when the more detailed percentage of the ingredients is required.

# 4. Emergency and First Aid Procedures

### 4.1 Inhalation

If high concentrations are 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 grind 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 ground 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 grinding dust occurs , use dry sand, dry muscovite, ABC type (for general, oil and electricity fire) powder fire extinguisher or water.

### 5.2 Unusual Fire and Explosion

If dust from grinding 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 spontaneous 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 from the grinding and machining operation, isolate area and do not walk throughelse 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

CVD Single Crystal Diamond is stable thus there is almost no effect to the human health, but long time or repetitive contact to dust or grinding liquid may damage the skin.
When grinding or machining CVD Single Crystal Diamond contained dust may be dispersed, use extraction to minimize the dust exposed to workers. Remove ground sludge as well as dust.
Wash hands thoroughly before eating, drinking and smoking. Do not eat, drink and smoke in the CVD Single Crystal Diamond handling area.
A periodic medical check-up is recommended.

### 7.2. Storage

Avoid drastic changes of temperature and high humidity.
Provide local exhaust ventilation system, or use respiratory protective equipment and/or dust mask to maintain suspended dust particles concentration level, below the limits shown in the following table.

## 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.

### 8.1 Permissible exposure limit in working environments

| Ingredients | Chemical formula | *OSHA PEL | **ACGIH TLV | ***JSOH OLEs |
|---|---|---|---|---|
| | | $mg/m^3$ | $mg/m^3$ | $mg/m^3$ |
| | | (Concentration of metal dust particles) | (Concentration of metal dust particles) | (Concentration of metal dust particles) |
| Diamond | C | N/A | N/A | N/A |

*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

It is recommended to wear respiratory protective equipment or dust mask for protection against dust.

### 8.3 Hands protection

It is recommended to wear protective gloves for protection against dust.

### 8.4 Eye protection

It is recommended to 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. It is recommended to use local exhaust ventilation system.

## 9. Physical and Chemical Properties

| | |
|---|---|
| Appearance/Odor | Black and Gray / No Odor |
| Boiling Point | Unknown |
| Vapor Pressure (mmHg) | Unknown |
| Vapor Density (Air=1) | Unknown |
| Water Solubility | Insoluble |
| Specific Gravity ($H_2O$=1) | 11 －14 |
| Volatile Component | 0 |
| Evaporation Rate | Unknown |

## 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

## 11. Toxicological Information

### 11.1 Acute Toxicity

Data of Products: No data available

### 11.2 Skin Corrosion / Irritation

Data of Products: No data available

### 11.3 Serious Eye Damage / Irritation

Data of Products: No data available

### 11.4 Respiratory or Skin Sensitization

Data of Products: No data available

### 11.5 Germ Cell Mutagenicity

Data of Products: No data available

### 11.6 Carcinogenicity

Data of Products: No data available

**11.7 Reproductive Toxicity**

Data of Products: No data available

**11.8 Specific Target Organ / Systemic Toxicity ( Single Exposure )**

Data of Products: No data available

**11.9 Specific Target Organ / Systemic Toxicity ( Repeated Exposure )**

Data of Products: No data available

**11.10 Aspiration Hazard**

Data of Products: No data available

## 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 sintered diamond.

**12.3 Bioaccumulation**

There has been no evidence of bioaccumulation for sintered diamond.

**12.4 Environmental impacts / Ecotoxicity**

There has been no evidence of ecotoxicity for sintered diamond.
Cobalt may be harmful to the environment. Precaution is especially required to the environmental impact of aquatic organism.

## 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

No data available on code and classifications according to international regulations for transport, regarding the description of this MSDS.
There are no restrictions concerning domestic or oversea transportation. In case of transportation, the products are sure to be loaded so that the containers will not fall, break or corrode.
Take care of handling because sharp edges might cause external injuries.

## 15. Regulatory Information (Japanese Applicable Law)

**PRTR Law**

Not applicable

**Occupational Safety & Health Administration Law**.

Not applicable

# 16. Other Information

**16.1 Notes on the following descriptions**

The details in this MSDS 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 MSDS, 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