

SAFETY DATA SHEET

Creation: April 22, 2020

1. Chemical and Manufacture Information

1.1 Product Name

SUMIDIA (sintered diamond) WD700/800/900

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 Recommend Use and Restrictions on Use of the Sintered Diamond

Wire-drawing diamond dies, etc.

1.4 Attention to the Phase/State of the Sintered Diamond

- Sintered diamonds in the solid state are not explosive, flammable, combustible, pyrophoric, water-tight, or oxidizing and are chemically stable and safe under normal use conditions.
- This SDS provides information on the raw material of sintered diamond and the dust generated during its processing.
- WD900 is a combination of the sintered diamond parts and the cemented carbide part or the tungsten alloy.
- The SDS of cemented carbide shows https://www.sumitool.com/en/csr/assets/pdf/sds_carbide_en.pdf or the website of each suppliers
- The SDS of tungsten alloy shows the website of each suppliers

2. Hazard Identification

2.1 GHS Classification

No GHS classification was made for impurities in sintered diamonds and the dust, fumes, or vapor that might occur from the sintered diamond production process because data on the burning rate tests were not available. The GHS classifications for the hazards of each of the metallic ingredients (cobalt, nickel, manganese, and aluminum), which are the main ingredients and impurities of sintered diamonds, are listed below. Other hazards and harmful effects (adverse health effects, environmental effects, physical/chemical hazards) that are not listed are uncategorized, unclassified, or non-applicable by the GHS.

• Cobalt

Health Hazards:	<ul style="list-style-type: none"> • Respiratory sensitization • Skin sensitization • Carcinogenicity • Specific target organ toxicity (single exposure) • Specific target organ toxicity (repeated exposure) 	Category 1 Category 1 Category 2 Category 3 (Respiratory tract irritation) Category 1 (Respiratory)
Environmental Hazards:	• Hazardous to the aquatic environment- Chronic	Category 4

• Nickel

Health Hazards:	<ul style="list-style-type: none"> • Respiratory sensitization • Skin sensitization • Carcinogenicity • Specific target organ toxicity (single exposure) 	Category 1 Category 1 Category 2 Category 1 (Respiratory)
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	exposure) • Specific target organ toxicity (repeated exposure)	kidney) Category 1 (Respiratory)
Environmental Hazards:	• Hazardous to the aquatic environment- Chronic	Category 4

• Manganese

Health Hazards:	• Skin corrosion/irritation • Serious eye damage/eye irritation • Reproductive toxicity • Specific target organ toxicity (single exposure) • Specific target organ toxicity (repeated exposure)	Category 3 Category 2B Category 1B Category 1 (Respiratory) Category 1 (Nervous system, respiratory)
Environmental Hazards:	• Hazardous to the aquatic environment- Chronic	Category 4

• Aluminum


Health Hazards:	• Specific target organ toxicity (single exposure) • Specific target organ toxicity (repeated exposure)	Category 1 (Respiratory) Category 1 (Respiratory)
Environmental Hazards:	• Hazardous to the aquatic environment	Category 4

2.2 GHS label elements

The GHS label elements for each of the main ingredients, cobalt and the metallic ingredients (nickel, manganese, and aluminum), which are impurities of sintered diamonds, are listed below.

	Cobalt	Nickel	Manganese
Hazard Pictograms:			
Signal Words:	Danger		
Hazard Statements:	<ul style="list-style-type: none"> • Risk of causing an allergic skin reaction. • Risk of causing allergies, asthma or breathing difficulties if inhaled. • Risk of respiratory irritation. • Suspected of causing cancer. • Causes respiratory, cardiovascular, thyroidal, and hematological failure due to long-term or repeated exposure. • May be harmful to aquatic life due to long-lasting effects. 	<ul style="list-style-type: none"> • Risk of causing allergies, asthma or breathing difficulties if inhaled. • Risk of causing an allergic skin reaction. • Suspected of causing cancer. • Causes respiratory and renal failure. • Cause of respiratory failure due to long-term or repeated exposure. • May be harmful to aquatic life due to long-lasting effects. 	<ul style="list-style-type: none"> • Causes mild skin irritation. • Causes eye irritation. • May damage fertility or unborn child. • Causes respiratory failure. • Cause of nervous and respiratory failure due to long-term or repeated exposure. • May be harmful to aquatic life due to long-lasting effects.

<p>Recautionary Statement:</p>	<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 proper protective gloves • When ventilation is insufficient, wear a respirator as required. • Do not breathe dust, fumes, or vapor. • Do not eat, drink, or smoke in the handling area. • After handling, wash the hands and face well and rinse the mouth. • Avoid release into the environment. <p>[First-aid Measures]</p> <ul style="list-style-type: none"> • If inhaled, move to fresh air and rest in a posture easy to breathe. • If respiratory symptoms occur, contact a doctor. • Seek medical advice/attention if you feel unwell. • 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 seek medical advice/attention. • If exposed or concerned, seek medical advice/attention. • If dust is in the eyes, immediately wash away with clean water (remove the contact lenses if possible). If irritation persists, seek medical advice/attention. • If a large amount of dust is swallowed, seek medical advice/attention after ingesting plenty of water to dilute. <p>[Storage]</p> <ul style="list-style-type: none"> • Avoid drastic changes of temperature and high humidity. <p>[Disposal]</p> <ul style="list-style-type: none"> • Dispose of contents/container to an approved waste disposal plant in compliance with all laws.
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	<p>Aluminum</p>
<p>Hazard Pictograms:</p>	
<p>Signal Words:</p>	<p>Danger</p>
<p>Hazard Statements:</p>	<ul style="list-style-type: none"> • Contact with water releases combustible, inflammable gases. • Causes respiratory failure. • Cause of respiratory failure due to long-term or repeated exposure. • May be harmful to aquatic life due to long-lasting effects.
<p>Recautionary Statement:</p>	<p>[Prevention]</p> <ul style="list-style-type: none"> • Keep away from any possible contact with water. • Handle under inert gas. Protect from moisture. • Do not breathe dust/gas/mist/vapor/spray. • Wash hands thoroughly after handling. • Do not eat, drink or smoke when using this product • Wear protective gloves/protective clothing/eye protection/face protection. • Avoid release to the environment. <p>[First-aid Measures]</p> <ul style="list-style-type: none"> • If exposed or concerned: Call a POISON CENTER or doctor/physician. • Seek medical advice/attention if you feel unwell. • Specific treatment is required. (see ... on this label) • Brush off loose particles from skin. Immerse in cool water/wrap in wet

	bandages. <ul style="list-style-type: none"> In case of fire: Use appropriate extinguishing agent for extinction. [Storage] <ul style="list-style-type: none"> Store in a dry place. Store in a closed container. Store locked up. [Disposal] <ul style="list-style-type: none"> Dispose of contents/container to an approved waste disposal plant in compliance with all laws.
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3. Composition/Information on Ingredients

- Distinction of a single product or mixture: Mixture
 - *Sintered diamonds are mainly composed of diamonds and cobalt and may contain nickel, manganese, and aluminum as impurities.
- Main ingredients and Contents and Scope of contents (WD700,900 series)

Composition	Chemical formula	CAS No.	Classification No. of by PRTR Law	Enforcement Serial No. by Industrial Safety and Health Laws	Formula mass%
Diamond	C	7782-40-3	-	-	75-85
Cobalt	Co	7440-48-4	Class 1-No. 132 Attached	No. 9-172 Table	15-25
Nickel	Ni	7440-02-0	Class 1-No. 308 Attached	No. 9-418 Table	0-15
Manganese	Mn	7439-96-5	Class 1-No. 311 Attached	No. 9-550 Table	0-15
Aluminum	Al	7429-90-5	-	No. 9-37 Table	0-5

- Main ingredients and Contents and Scope of contents (WD800 series)

Composition	Chemical formula	CAS No.	Classification No. of by PRTR Law	Enforcement Serial No. by Industrial Safety and Health Laws	Formula mass%
Diamond	C	7782-40-3	-	-	96-99
Cobalt	Co	7440-48-4	Class 1-No. 132 Attached	No. 9-172 Table	0-20
Nickel	Ni	7440-02-0	Class 1-No. 308 Attached	No. 9-418 Table	0-20
Manganese	Mn	7439-96-5	Class 1-No. 311 Attached	No. 9-550 Table	0-20
Aluminum	Al	7429-90-5	-	No. 9-37 Table	0-5

4. Emergency and First Aid Procedures

4.1 Inhalation

- If dust is inhaled or the worker exhibits trouble breathing (coughing, panting, breathless etc.), move to fresh air and allow to rest in a posture that permits easy breathing. 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 the eyes, flush with running water (remove the contact lenses if possible). If 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 Extinguishing media

- 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.
- In case of minor fire of aluminum: use powder fire extinguishing agent, soda ash, lime and sand; in case of major fire: use dry sand, powder fire extinguishing agent, soda ash, and lime.

5.2 Protection of firefighters

- Use protective clothing, a dust-proof mask, or a self-contained breathing apparatus.

6. Spill and Leak Procedures

6.1 Personal precautions

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

6.2 Environmental precautions

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

6.3 Methods and materials for containment and cleaning up

- For removal of dust, isolate the area and do not walk through else material will become 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

- Diamonds are stable thus there is almost no effect on human health, but long term or repeated contact with the dust or grinding liquid that contains cobalt, nickel, and manganese may damage the skin.
- When grinding or machining sintered diamonds, the cobalt, nickel, manganese, and aluminum contained in the dust may be dispersed; use extraction to minimize the dust exposed to workers.
- Do not handle until all safety precautions have been read and understood.
- Do not breathe dust, fumes, or vapor.
- Do not eat, drink, and smoke in the diamond handling area.
- After handling, wash hands well and rinse the mouth.
- Avoid release into the environment.

7.2 Storage

- Avoid drastic changes of temperature and high humidity.

8. Exposure Controls and Personal Protection

8.1 Exposure Control

• Permissible exposure limit in working environments (reference value)

Composition	Chemical formula	OSHA* PEL* mg/m ³ (Concentration of metal dust particles)	ACGIH* TLV* mg/m ³ (Concentration of metal dust particles)	JSOH Acceptable concentration: mg/m ³
Diamond	C	N/A	N/A	N/A
Cobalt	Co	0.1 (as Co)	0.02 (as Co)	0.05 (as Co)
Nickel	Ni	1.0 (as Ni)	1.5 (as Ni)	1.0 (as Ni)
Manganese	Mn	5.0 (as Mn)	0.2 (as Mn)	0.3 (as Mn)
Aluminum	Al	15 (as Al)	1.0 (as Al)	0.7 (as Al)

- *OSHA: Occupational Safety & Health Administration U.S. Department
- *PEL: Permissible Exposure Limit
- *ACGIH: American Conference of Governmental Industrial Hygienists Inc.
- *TLV: Threshold Limit Value
- *N/A: Not Applicable

8.2 Protective measures

- Respiratory protection: Wear respiratory protective equipment or dust masks for protection against the dust.
- Hand protection: Wear protective gloves for protection against the dust.
- Eye protection: Wear protective glasses or chemical safety goggles for protection against the dust.
- Skin and body protection: Avoid direct contact of dust with skin.
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.

9. Physical and Chemical Properties

Appearance:	Black solid
Odor:	No odor
pH:	No data
Melting point:	No data
Boiling point:	No data
Flash point:	No data
Vapor pressure:	No data
Specific gravity:	3~7.0
Solubility:	Insoluble

10. Stability and Reactivity

Each of the metallic ingredients (cobalt, nickel, manganese, and aluminum), which are the main ingredients and impurities of sintered diamonds, has the following information about stability and reactivity under specific conditions.

• Cobalt

Stability: Possibility of hazardous reactions: Conditions to avoid: Incompatible materials: Hazardous decomposition products:	<ul style="list-style-type: none"> • Stable to heat and contact with water. • Ignite spontaneously in air. • 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. • Contact with incompatible materials. • Strong oxidizing agents, acid. • By combustion, cobalt oxide and fumes of cobalt oxide may occur.
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• Nickel

Stability: Possibility of hazardous reactions: Conditions to avoid: Hazardous decomposition products:	<ul style="list-style-type: none"> • It is considered stable in storage and handling in accordance with the laws and regulations. • Metallic nickel is usually stabilized against oxidation by the oxide film, fresh metal surfaces without oxide film are rapidly oxidized by air. Thus with fresh metallic nickel powder, there is a risk of ignition in air. • No data • No data
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• Manganese

Stability: Possibility of hazardous reactions:	<ul style="list-style-type: none"> • Stable under normal handling conditions. • If heated, generate harmful fumes. • It reacts violently with many non-metals (chlorine, fluorine, oxygen, etc.) at high temperatures, and it poses a risk of fire or explosion. • It reacts violently with hydrogen peroxide, bromine pentafluoride,
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Conditions to avoid:	<p>nitrogen dioxide, and aluminum dust, and it poses a risk of fire or explosion.</p> <ul style="list-style-type: none"> • It reacts with boron, carbon, silicon, phosphorus, sulfur, and oxidizing agents. • It reacts explosively with nitric acid or ammonium nitrate. • In case of powder, it reacts with water or vapor to generate hydrogen. • When the powder and granule form is mixed with air, a dust explosion may occur. • Heat at high temperature. Mixture and contact with incompatible materials.
Incompatible materials:	<ul style="list-style-type: none"> • Strong oxidizing agents, strong acid (hydrogen peroxide, bromine pentafluoride, nitrogen dioxide, non-metals, aluminum dust, etc.)
Hazardous decomposition products:	<ul style="list-style-type: none"> • If heated, generate irritative, corrosive or toxic gases or fumes.

• Aluminum

Stability:	<ul style="list-style-type: none"> • Powders, foils, and ribbons burn when heated or exposed to flames • Non-flammable solid.
Possibility of hazardous reactions:	<ul style="list-style-type: none"> • When mixed with an oxidizing agent, it may ignite due to overheating, impact, or friction and may ignite spontaneously due to moisture or water. • When the powder and granule form is mixed with air, a dust explosion may occur. • It may spontaneously ignite on contact with halogens. • On contact with water, acid or alkali, hydrogen is generated and may explode. • It reacts with (powder) water and alcohol; it reacts violently with oxidizing agents, strong acids, and chlorinated hydrocarbon; and it poses a risk of fire or explosion • When the powder and granule form is mixed with air, a dust explosion may occur.
Conditions to avoid:	<ul style="list-style-type: none"> • Avoid fire, friction or shock.
Incompatible materials:	<ul style="list-style-type: none"> • Water, alkali, acid, oxidizing agents, alcohol
Hazardous decomposition products:	<ul style="list-style-type: none"> • No data

11. Toxicological Information

Acute toxicity:	No data available on sintered diamonds.
Skin corrosion/irritation:	No data available on sintered diamonds.
Serious damage/irritation for eyes:	No data available on sintered diamonds.
Respiratory sensitization or skin sensitization:	No data available on sintered diamonds.
Germ cell mutagenicity:	No data available on sintered diamonds.
Carcinogenicity:	Group 2A on IARC, as cobalt powder: Suspected to be carcinogenic in humans (References: 1)
Reproductive toxicity:	No data available on sintered diamonds.
Specific Target Organ/Systemic Toxicity (Single Exposure)	No data available on sintered diamonds.
Specific Target Organ/Systemic Toxicity (Repeated Exposure)	No data available on sintered diamonds.
Aspiration hazard:	No data available on sintered diamonds.

12. Ecological Information

Hazardous to the aquatic environment-acute

- There has been no evidence of hazardous to the aquatic environment-acute for sintered diamonds.

Hazardous to the aquatic environment-Chronic

- There has been no evidence of hazardous to the aquatic environment-chronic for sintered diamonds.

MOBILITY

- There has been no evidence of mobility for sintered diamonds.

13. Disposal Consideration**Method for safe and environmental preferred disposal:**

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

14. Transport Information**International Code**

UN No.:	Not applicable
UN classification:	Not applicable
Marine pollutants:	Not applicable

National Code

Land regulations:	Not applicable
UN No.:	Not applicable
UN classification:	Not applicable
Marine pollutants:	Not applicable

15. Regulatory Information

Each of the metallic ingredients (cobalt, nickel, manganese, and aluminum), which are the main ingredients and impurities of sintered diamonds, may require appropriate treatment in accordance with the following and other relevant regulations.

- Law for Pollutant Release and Transfer Register (PRTR)

Cobalt	“Class 1 designated chemical substances”, Cabinet Order No. 132
Nickel	“Class 1 designated chemical substances”, Cabinet Order No. 308
Manganese	“Class 1 designated chemical substances”, Cabinet Order No. 311

- Industrial Safety and Health Act

Cobalt	The substances are defined in the Article 57-2 of the Act, and the cobalt is listed by No. 172 in the Appended Table 9 in Article 18-2 of the Enforcement Order as “Dangerous or Harmful Substances to be reported as to their names, etc.” Article 2, Paragraph 1, Items 2 and 5, of the 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 Specific 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 the Appended Table 9 in Article 18-2 of the Enforcement Order as “Dangerous or Harmful Substances to be reported as to their names, etc.”
Manganese	The substances are defined in the Article 57-2 of the Act, and the manganese is listed by No. 550 in the Appended Table 9 in Article 18-2 of the Enforcement Order as “Dangerous or Harmful Substances to be reported as to their names, etc.”
Aluminum	The substances are defined in the Article 57-2 of the Act, and the aluminum is listed by No. 37 in the Appended Table 9 in Article 18-2 of the Enforcement Order as “Dangerous or Harmful Substances to be reported as to their names, etc.”

16. Other Information**16.1 Other hazard and toxicity information**

- Ingestion of the dust containing high levels of cobalt may cause damage to the blood, heart, thyroid gland, and spleen. (References: 2)

- Recent studies indicate that repeated inhalation or long term contact with cobalt or nickel or manganese metal may affect the skin, respiratory organs, heart, etc. (References: from 3 to 6)
- Although there is no carcinogenic knowledge about Sintered Diamond, there is the following knowledge about impurities.

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)
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)
Manganese	IARC	not classifiable as to its carcinogenicity to humans

*ACGIH: American Conference of Governmental Industrial Hygienists Inc.

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*IARC: International Agency for Research on Cancer

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16.2 Handling of the descriptions in this document

The details in this SDS have been based on our best investigations and evidence. The information may be revised according to new evidence, tests etc.; however, the figure of contents, physical, chemical properties or others are not guaranteed. And cautions are set for normal usage, do not guarantee a safety.

16.3 Reference URLs

- Ministry of Economy, Trade and Industry: <http://www.meti.go.jp/>
- Homepage of Ministry of Environment (Pollutant Release and Transfer Register): <http://www.env.go.jp/>
- Homepage of Ministry of Health, Labor & Welfare (Industrial Safety and Health Act): <http://www.mhlw.go.jp/>
- Homepage of Japan Industrial Safety and Health Association: <http://www.jaish.gr.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>

16.4 Reference Documents

- IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, vol. 86 (2006).
- Food & Drug Research Laboratories, study No. 8005B (4.11.84).
- T. Shirakawa et al., Chest. 95, 29 (1989).
- International Chemical Safety Cards (cobalt, chromium, nickel, nickel oxide, magnesium oxide, aluminium oxide).
- Danger and hazardous property handbook of a chemical substance (Japan Industrial Safety & Health Association).
- A. O. Bech et al., Brit. J. Ind., 19, 239 (1962).

16.5 Revision History

Establishment	April 22, 2020	

End of document