# Safety Data Sheet（SDS）

Date Revised: December 01, 2015

## 1. Identification of the Substance/Preparation and of the Company

**Product**

Chemical Name: Cermet , Coated Cermet

**Supplier Information**

| | |
|---|---|
| Company Name: | MITSUBISHI MATERIALS CORPORATION |
| Address: | 3-2, Otemachi 1-chome Chiyoda-ku Tokyo 100-8117 Japan |
| Telephone Number: | +81-3-5252-5381 |
| FAX Number: | +81-3-5252-5436 |
| Emergency Telephone : | +81-297-42-1111 +81-297-42-7015<br>Quality Assurance Division Tsukuba Branch<br>8:00am to 4:30pm,except Sundays ,National holidays and Company holidays. |

**Recommended Use and Restrictions on Use**

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

**Attention to the phase/state of the product**

- When using as solid state like cutting tool, it is chemically stable and safe.
- When machining, grinding, cutting, or rolling metals with Cermet tool on normal condition, it is safe.
- This SDS describes information of raw material powder of the product and sludge, dust, fume or vapor when machining with the product.

## 2. Hazard Identification

**The GHS classification of cobalt in the case of cobalt is included**

| | | |
|---|---|---|
| Physical Hazard | ・Flammable liquids | Not classified |
| Health Hazard | ・Acute toxicity Oral<br>・Respiratory sensitization<br>・Skin sensitization<br>・Carcinogenicity<br>・Reproductive toxicity<br>・Specific target organ toxicity (Single exposure)<br>・Specific target organ toxicity (Repeated exposure) | Not classified<br>Category1<br>Category1<br>Category2<br>Category2<br>Category3<br>(Respiratory tract irritation)<br>Category1<br>(Respiratory) |
| Environmental Hazard: | ・Hazardous to the aquatic environment | Category4 |

※For those not described are those that can not be classified or is outside the classification target.

**GHS label elements**

| | | |
|---|---|---|
| | Raw material powder and sludge, dust, fume or vapor when grinding | Alloy and products as solid state |

| | | |
|---|---|---|
| Hazard Pictograms |  | |
| Signal Words | Danger | Not applicable |
| Hazard Statements | ・Risk of causing allergies, asthma or breathing difficulties if inhaled.<br>・Risk of causing an allergic skin reaction.<br>・May cause cancer.<br>・May cause adverse effects on fertility or the unborn child.<br>・Risk of respiratory irritation.<br>・Cause of respiratory failure due to long-term or repetitive exposure.<br>・Risk of harmful impact to aquatic life with long lasting effects. | Not applicable |
| Precautionary Statements | Prevention;<br>・Obtain special instructions before use.<br>・Do not handle until all safety precautions have been read and understood.<br>・Use appropriate personal protection and ventilation system keeping away from exposure.<br>・Wear suitable protective gloves.<br>・When insufficient ventilation, wear respirator as required.<br>・Do not breathe dust, fume or vapor.<br>・Do not eat, drink or smoke when using this product.<br>・Use under open-air or efficient ventilation.<br>・Wash skin thoroughly after handling.<br>・Do not release into the environment.<br><br>Responses;<br>・If inhaled, move to fresh air and take a rest with posture easy to breathe.<br>・If respiratory symptoms occurs, contact a doctor.<br>・When feeling ill, get medical advice/attention.<br>・Take off contaminated clothing | Prevention;<br>・Obtain special instructions before use.<br>・Do not handle until all safety precautions have been read and understood.<br>  |

| | | |
|---|---|---|
| | and wash before reuse.<br>・If on skin, rinse away immediately with a large amount of water and soap.<br>・If skin irritation occurs, contact a doctor and get medical advice/attention.<br>・If exposed or concerned, get medical advice/attention.<br><br>Disposal;<br>・Dispose of contents/container to an approved waste disposal plant under the laws. | |

## 3. Composition/Information on Ingredients

- Cermet may be coated with the following substances.
  AlN、$Al_2O_3$、(Al,Ti)N、$B_4C$、$Cr_3C_2$、CrN、$MoS_2$、Ti(B,C,N)、TiC、(Ti,Zr)N、WC
- Distinction between Substance and Mixture： Mixture (alloy)
- Ingredients and Concentration or Concentration Range (Composition)

| Ingredient | Chemical Formula | CAS No | Official Number ,Law for PRTR* | Industrial Safety and Health Law(Official Number) | Composition mass% |
|---|---|---|---|---|---|
| Titanium carbide | TiC | 12070-08-5 | N/A | N/A | 15-50 |
| Titanium nitride | TiN | 25583-20-4 | N/A | N/A | 0-30 |
| Tungsten carbide | WC | 12070-12-1 | N/A | N/A | 0-30 |
| Tantalum carbide | TaC | 12070-06-3 | N/A | N/A | 0-20 |
| Niobium carbide | NbC | 12069-94-2 | N/A | N/A | 0-20 |
| Molybdenum carbide | $Mo_2C$ | 12069-89-5 | Class1:453 | Appendix 9-603 | 0-20※ |
| Zirconium carbide | ZrC | 12070-14-3 | N/A | Appendix 9-313 | 0-5 |
| Cobalt | Co | 7440-48-4 | Class1:132 | Appendix 9-172 | 0-20※ |
| Nickel | Ni | 7440-02-0 | Class1:308 | Appendix 9-418 | 0-20※ |
| Chromium | Cr | 7440-47-3 | Class1:87 | Appendix 9-142 | 0-5※ |

*Law for PRTR:Law concerning Reporting, etc. of Releases to the Environment of Specific Chemical Substances and Promoting Improvements in Their Management.- 2 –

For the details regarding the content of the designated chemical material such as cobalt, nickel, and chromium (effective digit: 2), please contact the above address

## 4. First-Aid Measures

**If Inhaled**

- If the high concentration of dust from grinding scraps is inhaled or respiratory symptoms (coughs, gasping, shortness of breath, etc.) are experienced, evacuate and isolate the workplace. 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 and attention.

**If on Skin**
- If dust from grinding scraps 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 from grinding scraps is in eyes, immediately wash away with clean water. 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

**Extinguishing Media**
- To extinguish the fire of dusts resulting from grinding, use dry sand, dry dolomite, 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).

**Unusual Fire and Explosion**
- Dusts resulting from grinding are very fine and under the specific conditions in which the dusts are mixed with grinding oil with low flash point, it is possible to become pyrophoric. If dusts under very flammable conditions are dispersed in the air, it is possible to explode. In such cases, look to your own safety first and then take necessary fire-fighting measures.

**Special Protective Actions for Fire-Fighters**
- In fighting a fire, wear a dust-proof respirator or respiratory protective equipment.

## 6. Accidental Release Measures

**Personal Precautions**
- It is recommended that someone who cleans grinding scraps or dusts should wear clothing and respiratory protective equipment to minimize exposure.

**Environmental Precautions**
- Dispose of dusts as industrial wastes and prevent release in water systems.

**Cleaning Up Methods**
- If there are dusts from resulting from grinding and mechanical processing, isolate the area and remove with a cleaner equipped with a filter which can take up fine particles very efficiently. If appropriate removing methods are not available, sweep with water sprayers or wet mops.

## 7. Handling and Storage

**Handling**
- Cermet is stable and has little effect on health. However prolonged or repeated exposure to the dust or grinding liquid containing cobalt or nickel may cause rough skin.
- As the specific gravity of Cermet is great, handle as a large-sized product or in the case of large quantity, as a heavy product.
- In grinding or mechanical processes, provide local exhaust ventilation and use personal

protective equipment to minimize exposure to human body, due to the possibilities of the disperse of dust containing cobalt or nickel. Do the same way for grinding sludge.
- Wash hands thoroughly before eating, drinking, and smoking. Do not eat, drink, and smoke in the handling area.
- Regular physical checkups are recommended.

**Storage**
- Avoid sudden changes of temperature and high humidity for storage.

## 8. Exposure Controls/Personal Protection

Provide local exhaust ventilation so that dusts in the air may not exceed the exposure limits in the following table. If it is possible that a concentration may exceed the permissible level, use a dust-proof respirator or respiratory protection. It is to be noted that management concentration of the cobalt (and its inorganic compounds) is to be 0.02mg/m$^3$ in accordance with the working environment assessment standard by the Minister of Health, Labour and Welfare under the paragraph (2), Article 65-2 of the Industrial Safety and Health Act in Japan.

Face washing vessel and shower system shall be provided in a work place where these materials are handled or in storages. Also dressing facilities and laundry equipment should be installed there.

□Permissible Concentration in Working Environment

| Ingredient | Chemical Formula | OSHA* PEL* mg/m$^3$ (Metal Dust Concentration) | ACGIH* TLV* mg/m$^3$ (Metal Dust Concentration) | Japan Society for Occupational Health Exposure Limit mg/m$^3$ |
|---|---|---|---|---|
| Titanium carbide | TiC | N/A | N/A | N/A |
| Titanium nitride | TiN | N/A | N/A | N/A |
| Tungsten carbide | WC | N/A | 5 (as W) | N/A |
| Tantalum carbide | TaC | N/A | N/A | N/A |
| Niobium carbide | NbC | N/A | N/A | N/A |
| Molybdenum carbide | $Mo_2C$ | 15 | 10 (as Mo) | N/A |
| Zirconium carbide | ZrC | 5 | 5 | 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 & 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

**Protective Equipment**
- Respiratory Protection: Dust-proof respirators and respiratory protective equipment are recommended.
- Hand Protection: Protective gloves for dusts are recommended.
- Eye Protection: Protective glasses for dusts are recommended.
- Skin/Body Protection: Avoid direct skin contact.
  Clean up deposited dust on clothing, rags, etc. by washing or absorbing with suitable filters but not by whisking off. Change the contaminated clothing into clean one.

Local exhaust ventilation is recommended.

## 9. Physical and Chemical Properties

| | |
|---|---|
| Appearance: | Dark gray solid |
| Odor: | Odorless |
| pH: | No data available |
| Melting Point: | |
| Boiling Point: | No data available |
| Flash Point: | No data available |
| Vapor Pressure: | No data available |
| Specific Gravity: | 6.0 – 9.0 |
| Solubility: | Insoluble |

## 10. Stability and Reactivity

**Reactivity**

- Can be a possible cause to produce harmful gases in contact with chemical such as acid.

**Chemical Stability**

- This product is in solid form and therefore chemically stable as it is and not explosive, flammable, combustible, pyrophoric, water-reactive, and oxidizing in normal environment.

**Possibility of Hazardous Reactions**

- Not applicable

**Conditions to Avoid**

- Contact with the following 'Incompatible Materials'

**Incompatible Materials**

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

**Hazardous Decomposition Products**

- None

## 11. Toxicological Information

**Acute Toxicity**

Data on this product: No data available

**Skin Corrosion/Irritation**

Data on this product: No data available

**Serious Eye Damage/Eye Irritation**

Data on this product: No data available

**Respiratory or Skin Sensitization**

Data on this product: No data available

**Germ Cell Mutagenicity**

Data on this product: No data available

**Carcinogenicity**

Data on this product: Group 2A on IARC, as cobalt powder coexisting with tungsten carbide powder. Suspected to be carcinogenic in humans (Ref. 6)

**Reproductive Toxicity**

Data on this product: No data available

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

Data on this product: No data available

**Specific Target Organ Toxicity/Systemic Toxicity**

**(Repeated Exposure)**
Data on this product: No data available
**Aspiration Hazard**
Data on this product: No data available

## 12. Ecological Information

**Mobility**
- Although dusts in the air are mobile, they are likely to be deposited due to the great specific gravity.

**Persistence**
- Not reported on Cermet

**Bioaccumulative Potential**
- Not reported on Cermet

**Environmental Effects**
- Not reported on Cermet

## 13. Disposal Considerations

**Disposal Method**
- The main ingredients such as tungsten carbide, cobalt, nickel are rare metal. It is desirable to collect and recycle them.
- For disposal, conform to the applicable laws regarding industrial wastes such as 'Waste Disposal and Public Cleansing Law' and relevant local by laws.

## 14. Transport Information

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

## 15. Regulatory Information

- Law concerning Reporting, etc. of Releases to the Environment of Specific Chemical Substances and Promoting Improvements in their management in Japan.
  ( Law for Pollutant Release and Transfer Register)
  Cobalt: "Class 1 designated chemical substances" No.132
  Nickel: "Class 1 designated chemical substances" No.308
  Chromium: "Class 1 designated chemical substances" No.87
  Molybdenum: "Class 1 designated chemical substances" No. 453- 5

- Industrial Safety and Health Law in Japan.
  Cobalt: The substances are defined in the Article 57-2 of the Act, and the cobalt is listed by No.172 in Appended Table9in the Article 18-2 of the Enforcement Order as "Dangerous or Harmful Substances to be notified their names, etc."
  Nickel: The substances are defined in the Article 57-2 of the Act, and the nickel is listed by No.418 in Appended Table9in 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 Table9in the Article 18-2 of the Enforcement Order as "Dangerous or Harmful Substances to be notified their names, etc."
  Molybdenum: The substances are defined in the Article 57-2 of the Act, and the

Molybdenum is listed by No.603in Appended Table9in the Article 18-2 of the Enforcement Order as “Dangerous or Harmful Substances to be notified their names, etc.”

Zirconium : The substances are defined in the Article 57-2 of the Act, and the Zirconium is listed by No.313in Appended Table9in the Article 18-2 of the Enforcement Order as “Dangerous or Harmful Substances to be notified their names, etc.”

In other region, follow the local regulations.

## 16. Other Information

### Other Hazardous Information

The following attention should be paid for dusts resulting from cutting and grinding Cermet.

- Dusts resulting from cutting and grinding irritates the mucous membranes of the nose, mouth, throat, and eyes; they also irritate the respiratory organs and lungs. Symptoms include allergic skin rash, and coughs, asthma, shortness of breath, chest pressure and tightness in the chest.
- If a large amount of dust containing cobalt is inhaled, blood, heart, thyroid gland, and spleen disorders may result. (References 1)
- It is reported that repeated or prolonged contact with cobalt, nickel, or chromium may affect skin, respiratory organs, heart, etc. (References 2 – 5)

Although it is not reported that Cermet is carcinogenic, the following is reported on raw material powders and metal ingredients.

| | | |
|---|---|---|
| Metallic cobalt powders with tungsten carbide | IARC | 2A: Probably carcinogenic to humans. (References 6) |
| Cobalt metal | ACGIH | A3: Confirmed animal carcinogen with unknown relevance to humans. |
| | 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). |
| Nickel metal | ACGIH | A5: Not suspected as a human carcinogen. |
| | 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). |
| Chromium metal | IARC | 3: Not classifiable as to its carcinogenicity to humans. |

*ACGIH : American Conference of Governmental Industrial Hygienists Inc.

*IARC : International Agency for Research on Cancer

Although Cermet is unknown about environmental effects, the following is reported on metal ingredients.

- Cobalt and chromium may be harmful to the environment. Special attention should be paid for the effect on aquatic life.

**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.

**References**

(1) Food & Drug Research Laboratories, study No.8005B (4.11.84).
(2) T. Shirakawa et al., Chest. 95, 29 (1989).
(3) International Chemical Safety Cards (cobalt, chromium, nickel).
(4) The Guide to Chemical Hazards (edited by Japan Industrial Safety & Health Association)
(5) A. O. Bech et al., Brit. J. Ind., 19, 239 (1962).
(6) IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, vol.86 (2006).