Safety Data Sheet (SDS)

Latest revision: 01/Jan./2026

1. Identification of the Substance and of the Company

Product Identifier: Ceramic (including coated or surface-treated Ceramic)

Supplier Information:

Company Name:	Tungaloy Corporation
Address:	11-1 Yoshima-Kogyodanchi, Iwaki-city Fukushima, 970-1144 Japan
Contact Department:	Environmental Group, Quality Assurance Div.
Phone Number:	+81-246-8501
E-mail:	Environmental.Gr@tungaloy.co.jp

Recommended Use of the Ceramic

Cutting and drilling tools for metallic materials, wear-resistant tools for plastic processing

Restrictions on Use of the Ceramic

Do not use for other than the specified purpose

Attention to the Phase/State of the Ceramic

- Ceramic as a solid state is chemically stable and safe from explosive, flammable, combustible, pyrophoric, water reactive and oxidizable in a normal environment.
- Ceramic 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 Ceramic producing process such as raw material powder handling and grinding.

2. Hazard Statements:

The GHS Classification

No applicable to ceramics.

- GHS classification of dusts generated from ceramic raw materials and processing.

Physical and Chemical Hazard:	• Flammable solids	Not applicable
	• Pyrophoric solids	Not applicable
	• Self-heating chemicals	Not applicable
	• Chemicals that react with water to emit flammable gases	Not applicable
	• Oxidizing solids	Not applicable
Health hazard:	• Acute Toxicity (Oral)	Not applicable
	• Carcinogenicity	Not applicable
	• Specific Target Organ Toxicity (Single Exposure)	Category 3 (respiratory tract irritation)
	• Specific Target Organ Toxicity (Repeated Exposure):	Category 1 (lungs)

GHS Label Elements

Not applicable to ceramics

GHS label elements for ceramic raw materials and dusts generated during processing are as follows:

Hazard Pictograms:	
Signal Words:	Danger
Hazard Statements:	• May cause respiratory irritation (airway irritation). • Prolonged or repeated exposure may cause organ damage (lungs).

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, please refer to “Safety Precautions” in our general catalog.

3. Composition/Information on Ingredient

- Distinction between substance and mixture: Mixture (alloy)
- Chemical name or general name: Ceramic

Ceramic may be coated or surface treated with the following substances.
AlCrN, AlN, Al_2O_3, (Al,Ti)N, B4C, Cr_3C_2, CrN, MoS_2, Ti(B,C,N), TiC, TiCN, TiN, (Ti,Si)N, (Ti,Zr)N, WC, etc.

- Ingredients and concentration range (composition) of Ceramic

Ingredient	Chemical Formula	CAS No	Composition mass%
Aluminum oxide	Al_2O_3	1344-28-1	0 to 100
Zirconium oxide	ZrO_2	1314-23-4	0 to 40
Yttrium oxide	Y_2O_3	1314-36-9	0 to 40
Magnesium oxide	MgO	1309-48-4	0 to 20
Hafnium oxide	HfO_2	12055-23-1	0 to 5
Titanium carbide	TiC	12070-08-5	0 to 50
Silicon carbide	SiC	409-21-2	0 to 100
Tungsten carbide	WC	12070-12-1	0 to 95
Boron carbide	B_4C	12069-32-8	0 to 70
Vanadium carbide	VC	12070-10-9	0 to 10
Titanium carbonitride	TiCN	12654-86-3	0 to 50
Silicon nitride	Si_3N_4	12033-89-5	0 to 100
Titanium nitride	TiN	25583-20-4	0 to 50
Boron nitride	BN	10043-11-5	0 to 30
Aluminum nitride	AlN	24304-00-5	0 to 5

*The composition of each component varies depending on the ceramic material.

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 Ceramic 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 or nickel 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 Ceramic

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
Aluminum oxide	Al_2O_3	5 (as Al)	10
Zirconium oxide	ZrO_2	5 (as Zr)	5 (as Zr)
Yttrium oxide	Y_2O_3	1 (as Y)	1 (as Y)
Magnesium oxide	MgO	15	10
Hafnium oxide	HfO_2	N/A	0.5 (as Hf)
Titanium carbide	TiC	N/A	N/A
Silicon carbide	SiC	N/A	0.1
Tungsten carbide	WC	5 (as W)	5 (as W)
Boron carbide	B_4C	N/A	N/A
Vanadium carbide	VC	N/A	N/A
Titanium carbonitride	TiCN	N/A	N/A
Silicon nitride	Si_3N_4	5 (as Si)	3 (as Si)
Titanium nitride	TiN	N/A	N/A
Boron nitride	BN	10	10
Aluminum nitride	AlN	5 (as Al)	1 (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

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

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:	Dark gray color (In case of the coated or surface treated Ceramic, the appearance color is often different.)
Odor:	Odorless
Melting/Freezing Point:	No data available
Boiling or Initial Boiling Point and Boiling Range:	No data available
Flammability, Explosion Limits, Flammability Limit, Flash Point, Spontaneous Ignition Temperature, Resolution Temperature:	No data available
pH:	No data available
Kinematic Viscosity:	No data available
Solubility:	Insoluble
Vapor Pressure:	No data available

Specific gravity:	11.0 to 15.5
Relative Gas Density:	No data available
Particle Properties:	No data available

10. Stability and Reactivity

A grain of dust which occurs from Ceramic producing process is 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 dust under very flammable conditions is dispersed in the air, it is possible to explode.

11. Toxicological Information

Acute Toxicity:	No data available on Ceramic
Skin Corrosion/Irritation:	No data available on Ceramic
Serious eye damage/Eye irritation:	No data available on Ceramic
Respiratory or Skin Sensitization:	No data available on Ceramic
Germ Cell Mutagenicity:	No data available on Ceramic
Carcinogenicity:	No data available on Ceramic
Reproductive Toxicity:	No data available on Ceramic
Specific Target Organ Toxicity (Single Exposure):	No data available on Ceramic
Specific Target Organ Toxicity (Repeated Exposure):	No data available on Ceramic
Aspiration Hazard:	No data available on Ceramic

12. Ecological Information

Ecotoxicity, Persistence/Degradability, Bioaccumulation, Mobility in soil, Hazardous to the ozone layer

- No data available on Ceramic

13. Disposal Considerations

Safe and environmentally desirable disposal or recycle method

- For disposal, comply with the applicable laws and regulations regarding industrial waste.

14. Transport Information

International Regulations

UN Number:	Not applicable
Proper Shipping Name:	Not applicable
UN Hazard Class:	Not applicable
Packing Group:	Not applicable
Marine Pollutant:	Not applicable

Special Safety Measures for Transportation and Transportation Method

When transporting the dust which occurs from Ceramic 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. Other Information

Other Hazardous Information

- It has been reported that repeated or prolonged contact with zirconium oxide may affect the skin, respiratory organs, heart, etc. (References 3,4)
- Inhaling high concentrations of aluminum oxide dust can irritate the eyes and upper respiratory tract. (Reference 4)
- Repeated or long-term inhalation and exposure of aluminum oxide may cause effects on the central nervous system. (Ref.4)
- Zirconium oxide can cause dizziness, increased perspiration, decreased capillary resistance, increased warmth and pain sensation, granuloma of the skin, irritating symptoms of mild respiratory organs.
- Magnesium oxide irritates the eyes and nose. Also, inhaling fumes may cause metal fume fever. (Ref.4)

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 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) International Chemical Safety Cards (cobalt, chromium, nickel).
(4) A. O. Bech et al., Brit. J. Ind., 19, 239 (1962).