

# MATERIAL SAFETY DATA SHEET

**CHEMICAL NAME:** CERAMIC (Silicon Nitride system)

## 1. CHEMICAL AND MANUFACTURER INFORMATION

1-1. Chemical Name :

Ceramic, Coated Ceramic and Ceramic Tools (Silicon Nitride system)

1-2. Company Information

Manufacturer : Kyocera Corporation

Address : 6 Takeda Tobadono-Cho, Fushimi-Ku Kyoto 612-8501

Division : Corporate Cutting Tool Group

Phone No. : 075-604-3651

FAX No. : 075-604-3472

Emergency Contact : General Administration Dept. (Sendai Plant) Phone No. : 0996-23-4121

1-3. Chemical Family : Ceramic (Refractory Metal Oxide, Carbide, Nitride, Charcoal Nitride)

## 2. COMPOSITION / INGREDIENTS / IDENTITY INFORMATION

CERAMIC (Silicon Nitride system) may be coated with the following materials:

TiN, TiC, Ti(C, N), (Ti, Al)N, Al<sub>2</sub>O<sub>3</sub> etc.

■ Single / Mixture : Mixture

■ Ingredients and Composition of Ceramic (Silicon Nitride system)

Ingredient	Chemical Formula	CAS#	Official Number ,Law for PRTR*	Industrial Safety and Health Law(Official Number)	Composition wt%
Silicon Nitride	Si <sub>3</sub> N <sub>4</sub>	12033-89-5	N/A	N/A	50--95
Titanium Carbonitride	TiCN	N/A	N/A	N/A	0--40
Erbium Oxide	Er <sub>2</sub> O <sub>3</sub>	12061-16-4	N/A	N/A	0--10
Aluminum Oxide	Al <sub>2</sub> O <sub>3</sub>	1344-28-1	N/A	Appendix 9-189	0--5
Titanium Oxide	TiO <sub>2</sub>	13463-67-7	N/A	Appendix 9-191	0--5
Others	---	N/A	N/A	N/A	0--2

## 3. HAZARDOUS DATA

3-1. Fire and Explosion Hazard: Ceramic is nonflammable in the solid state. However, dusts produced from grinding may trigger a spontaneous ignition or an explosion if allowed to accumulate.

There is no information available regarding the flash point, ignition limit, and explosion limit etc.

3-2. Health Hazard: Dust from grinding can cause irritation of skin and eyes.

3-3. Environmental Impact: There is no information available to be harmful.

## 4. EMERGENCY AND FIRST AID PROCEDURES

Inhalation:

- When inhaling high concentrations of dust from grinding, or if symptoms of pulmonary involvement develop (coughing, wheezing, shortness of breath, etc.), remove the worker from exposure. Give oxygen in the case of breathing difficulty.
- If irritation or rash persists, or in the case of breath-holding, seek medical attention after giving artificial respiration.

Skin Contact: If the dust from grinding contacts on skin, thoroughly wash affected area with soap and water and isolate from exposure. If irritation or rash persists, seek medical attention.

Eye Contact: If the dust from grinding contacts on the eyes, flush with large amounts of water. If irritation persists, seek medical attention.

Ingestion: If a large amount of dust is swallowed, drink copious amounts of water to dilute it and seek medical attention.

## 5. FIRE AND EXPLOSION HAZARD DATA

Extinguishing Media: For dust explosion or fire, use dry sand, dry dolomite, ABC type dry chemical extinguisher (for general, oil, and electricity fire), or water (avoid using water for the dust from grinding of light metals such as Magnesium, Aluminum, etc.)

Unusual Fire and Explosion Hazards: The dust from grinding may possibly self-ignite under the specific conditions when the particle size is extremely fine and mixed with the grinding fluid with low flash point. When the dust under the specific condition for easily-to-ignite is dispersed into the air, it may exceed the explosion limit. In such cases, assure the personal safety firstly and take the necessary extinguishing measures.

Special Firefighting Procedures: Wear dust-protective mask or other respiratory protective devices.

\* There is no statement about ceramic regarding a danger classification by NFPA (National Fire Protection Association)

## 6. SPILL OR LEAK PROCEDURES:

Health Hazard Protection: Wearing the Clothing to minimize the exposure of the dust and other respiratory protective devices is recommended to those who will clean up the dust from grinding.

Environmental Conservation: Dispose of as industrial waste in accordance with appropriate government regulations and avoid leaking into water systems.

Removal Method: About the dust leaked from grinding or machining, isolate a place and remove using the cleaner equipped with the filter which can collect particulates in high efficiency etc. When there is no suitable removal method, let a dust become wet with fog-like water or the wet mop for floors, and remove it.

## 7. PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:

Handling: Ceramic is a stable material and is not considered to be a physical or health hazard. However, there is the possibility of causing skin problems when contacting the dust or grinding fluid containing ceramic for long hours or repeatedly.

Wash hands thoroughly after handling, before eating or smoking. Do not eat, drink and smoke at the handling area. Periodic medical examination is recommended for individuals regularly exposed to dust or mist.

Storage: Store in a dry form within doors. Avoid the sudden temperature change and the humid conditions.

Additional Process such as Grinding:

When grinding or machining this product, minimize the exposure of the dust and sludge by local exhaust ventilation and other protective devices.

Strength may deteriorate significantly depending on the surface conditions. Be sure to use diamond wheel for finishing. When regrinding, make sure there is no crack on the product surface after regrinding process.

Laser marking on ceramic products may produce cracks. Do not apply laser marker on the stressed part.

## 8. SPECIAL PROTECTION INFORMATION

Use dust-protective mask, respirator or implement local exhaust ventilation. Airborne dust should not exceed the permissible level on the following table.

Occupational Exposure Limit values

Ingredient	Chemical Formula	OSHA*PEL* mg/m <sup>3</sup> (Metal dust concentration)	ACGIH*TLV* mg/m <sup>3</sup> (Metal dust concentration )	JSOH*OEL* mg/m <sup>3</sup> (Respirable dust conc. )
Silicon Nitride	Si <sub>3</sub> N <sub>4</sub>	N/A	N/A	**
Titanium Carbonitride	TiCN	N/A	N/A	**
Erbium Oxide	Er <sub>2</sub> O <sub>3</sub>	N/A	N/A	**
Aluminum Oxide	Al <sub>2</sub> O <sub>3</sub>	5	10	**
Titanium Oxide	TiO <sub>2</sub>	15	10	**

- OSHA: Occupational Safety & Health Administration U.S. Department of Labor
- PEL: Permissible Exposure Limit
- ACGIH: American Conference of Governmental Industrial Hygienists Inc.
- TLV: Threshold Limit Value
- JSOH: Japan Society for Occupational Health
- OEL: Occupational Exposure Limit
- N/A: Not Applicable
- \*\* :It is classified the third dust, respirable dust concentration is max. 2 mg/m<sup>3</sup>

### Protective Equipments:

Respiratory Protection: Dust-protective mask and respirator are recommended.

Hand Protection: Protective gloves are recommended.

Eye Protection: Safety glasses with side shields or goggles are recommended.

Skin & Body Protection: Avoid the direct skin contact with dust.

Do not shake clothing, rags or other items to remove dust. Dust should be removed by washing or vacuuming (with appropriate filters) the clothing, rags or other items. Clean work clothing should be worn daily.

Local exhaust ventilation is recommended.

## 9. PHYSICAL AND CHEMICAL DATA

Appearance and Odor	Gray, etc.	No Odor Solid	
Boiling Point	N/A	Specific Gravity (H <sub>2</sub> O=1)	3.0 - 4.0
Vapor Pressure (mmHg)	N/A	Percent Volatile by Volume	0
Vapor Density (Air=1)	N/A	Evaporation Rate	N/A
Solubility in Water	Insoluble		

Appearance may change depending on composition or coating materials.

## 10. STABILITY AND REACTIVITY DATA

Stability: Ceramic is stable under normal use conditions.

Conditions to avoid: There is no information available for conditions to avoid as composite material.

Hazardous decomposition products: None

## 11. HEALTH HAZARD DATA

Acute effect of overexposure: Dust or fumes from grinding this product can cause irritation of the nose, mouth, throat, eye mucosa, upper respiratory tract and lungs when inhaled. Symptoms of overexposure include allergic dermatitis, productive cough, wheezing, shortness of breath, and chest tightness, etc.

Ingestion of the dust containing high levels of aluminum oxide may cause irritation of the eyes and upper airway (Reference: 1)

Local effect:

There is no information available regarding ceramic.

Chronic effect of overexposure:

Repeated or long-term inhalation or exposure of aluminum oxide may affect central nerve system. (Reference: 1)

## 12. ENVIRONMENTAL IMPACT DATA

Mobility: There is no information available regarding ceramic.

Residual: There is no information available regarding ceramic.

Bioaccumulation: There is no information available regarding ceramic.

Environmental impact: There is no information available regarding ceramic.

## 13. WASTE DISPOSAL PRECAUTIONS

Disposal Method:

Dispose of in accordance with "Waste Disposal and Public Cleaning Law" in Japan. In other region, follow the local regulations.

## 14. TRANSPORT PRECAUTIONS

No transport regulations in Japan. In other region, follow the local regulations.

## 15. APPLICABLE LAW

Industrial Safety and Health Law (Obligation to produce MSDS: Ministry of Health, Labor and Welfare) in Japan.  
In other region, follow the local regulations.

## 16. OTHER DATA

Although Kyocera has attempted to provide current and accurate information herein, Kyocera makes no representations regarding the accuracy or completeness of the information and assumes no liability for any loss, damage, or injury of any kind which may result from or arise out of the use of or reliance on the information by any person.

Please refer to the following websites.

Ministry of Economy, Trade and Industry: <http://www.meti.go.jp/>

Ministry of Environment: <http://www.env.go.jp/>

Ministry of Health, Labor and Welfare: <http://www.mhlw.go.jp/>

ICSC (International Chemical Safety Cards): <http://www.nihs.go.jp/ICSC/>

<Reference>

1. International Chemical Safety Cards (Aluminum oxide)