

	<h1>Material Safety Data Sheet</h1>	Date of Preparation	Mar. 29, 2013
	<h2>[Material Safety Data Sheet]</h2>	Date of Revision	Mar. 19, 2019

1. Information on the Chemical Product and Company

A) Product name	Vitrified Grinding Wheel
B) Usage	For grinding/abraising
C) Information on the manufacturer	
Company name	Cheil Grinding Wheel Ind. Co., Ltd.
Address	34, 101-gil, Daesong-ro, Nam-gu, Pohang-si, Gyeongbuk, South Korea
Tel	82-54-285-8401

2. Harmfulness and Hazard

A) Classification of harmfulness and hazard	Severe eye damage/eye irritation: category 2 Carcinogen: classification 1B Toxicity on specific target organ (1 time exposure): classification 3 (respiratory system irritation)
---	--

B) Warning sign item including preventive action statements

Pictogram



Signal statement	Hazard
Harmfulness and hazard statement	H319 Causes severe irritation to eyes. H335 May cause irritation to the respiratory system. H350 May cause cancer.
Preventive action statement	P201 Obtain the user manual before using the product. P202 Do not deal with the product before you read and understand all safety preventive action statements. P261 Avoid the inhalation of dust, fume, gas, mist, steam, and spray. P264 Thoroughly wash out the handled part after handling. P271 Handle the product outdoors or in a place where ventilation is good. P280 Wear the protective gloves, clothes, glasses, and face protective equipment.
Response	P304+P340 If a person inhales the chemical material, carry the person to a place with fresh air, and make the person take a rest with a posture easy to breathe. P305+P351+P338 In the case of contacting with eyes, wash the eyes with water for several minutes. Remove the contact lens, if possible, and keep washing. P308+P313 Seek a medical action or advice, if you are exposed or worried to be exposed to the chemical material. P312 Receive the medical examination of a medical institution (doctor), if you feel discomfort. P337+P313 Seek a medical action/advice, if irritation continues to eyes.

	Material Safety Data Sheet	Date of Preparation	Mar. 29, 2013
	[Material Safety Data Sheet]	Date of Revision	Mar. 19, 2019

Storage P403+P233 Store the vessel in a place with good ventilation by sealing it thoroughly.
P405 Store the vessel in a place with a locking system.

Scrapping P501 Scrap the vessel of the content (according to the specified details of the relevant laws and regulations)

C) Other harmfulness and hazards not included in the harmfulness and hazard classification standards (NFPA)

Health 1
Fire No data available
Reactivity No data available

3. Components and Content

Component	Name	Content	CAS.NO
Abrasive	Silicon carbide	70~80%	409-21-2
Glue	Clay (gray)	20~30%	Classification not confirmed

4. Emergency Measure

- A) In case the chemical material contacts eyes Carefully wash your eyes for several minutes, if the material contacts your eyes. Remove contact lens and continuously wash the eyes, if possible.
Seek a medical action/advice, if irritation to eyes continues.
- B) In case a chemical material contacts skin Prevent the spread of contaminated part upon gentle contact with the skin.
Receive an emergency medical action.
Wash out your skin and eyes with running water for more than 20 min, when a chemical material contacts with the skin and eyes.
If you feel discomfort, receive medical examination from a medical institution (doctor).
Remove the contaminated clothes and shoes, and quarantine the contaminated area.
- C) In the case of inhalation If you are exposed to lots of dust or fume, remove them by getting fresh air. Take a medical action, if you cough or have other symptoms.
Seek a medical action or advice, if you are exposed or worried to be exposed to the chemical material.
- D) In the case of eating Seek a medical action or advice, if you are exposed or worried to be exposed to the chemical material.
If a person ate or inhaled the chemical material, use a proper breathing medical equipment without performing mouth-to-mouth resuscitation.
- E) Cautions by doctor Let the medical personnel recognize the chemical material and take a protective action.
Contact the medical personnel in the case of exposure, and take a special emergency action including tracking investigation.

	<h1>Material Safety Data Sheet</h1>	Date of Preparation	Mar. 29, 2013
	<h2>[Material Safety Data Sheet]</h2>	Date of Revision	Mar. 19, 2019

5. How to Cope with Explosion and Fire

A) Proper (improper) fire extinguishing material	<p>Use alcohol foam, CO₂, or water spray in the case of extinguishing a fire related to this chemical material.</p> <p>Upon suffocating fire extinguishment, use dry sand or earth.</p>
B) Specific harmfulness from the chemical material	<p>The vessel can be exploded upon being heated.</p> <p>Although nonflammable materials are not burned, they may cause corrosive and toxic fumes through decomposition upon being heated.</p> <p>Irritative and very toxic gas may be generated by pyrolysis or combustion during burning.</p>
C) Protective equipment and preventive actions upon fire extinguishment	<p>Rescuers need to wear proper protective equipment.</p> <p>Dig a ditch to dispose fire extinguishing water and contain it there, and then make sure the materials not to be scattered.</p> <p>Be careful because the chemical material can be melted and transported (carried).</p> <p>Move the vessel from the fire site, if it is not dangerous.</p> <p>Extinguish fire by maintaining safety distance beyond the fire site.</p> <p>In the case of a large scale fire such as a tank fire, use unmanned fire extinguishing equipment.</p> <p>If not, step back and let it burn.</p> <p>Cool off the vessel with lots of water, even after the fire is extinguished in the case of a tank fire.</p> <p>Immediately step back, if high sound is heard from the pressure discharge device, or if the tank color changes upon fire breaking out.</p> <p>In the case of a tank fire, extinguish it from a maximum distance, or use unmanned fire extinguishing equipment.</p> <p>Step back from the tank wrapped in flames in the case of a tank fire.</p>

6. How to Cope with Leakage Accident

A) Actions and protective equipment required to protect human body	<p>Avoid the inhalation of the dust, fume, gas, mist, steam, and spray.</p> <p>A person who does not need to enter or who has no protective equipment, do not enter.</p> <p>Remove all flammable sources.</p> <p>Immediately wipe out the spilled material, and comply with the preventive actions specified in the clause of protective equipment.</p> <p>Quarantine the contaminated area.</p> <p>Stop leakage, if it is not dangerous.</p> <p>Do not touch any damaged vessel or leaked material without wearing proper protective clothes.</p> <p>Prevent diffusion by covering with a plastic sheet.</p> <p>Be careful about the materials and conditions to be avoided.</p>
B) Actions required to protect the environment	<p>Prevent the inflow to the water channel, drain, basement, and sealed space.</p>
C) How to clean and remove	<p>Absorb the spilled material with an inactive material (for example, dry sand or earth), and put it in a chemical waste vessel.</p> <p>Absorb the liquid, and wash out the contaminated area with detergent and water.</p>

	Material Safety Data Sheet	Date of Preparation	Mar. 29, 2013
	[Material Safety Data Sheet]	Date of Revision	Mar. 19, 2019

7. How to Treat and Store

- A) Safe treatment method:
- Avoid the inhalation of dust, fume, gas, mist, steam, and spray.
 - Carefully open the lid before opening.
 - Do not handle the product before you read and understand all safety preventive action statements.
 - Handle the product outdoors or in a place with good ventilation.
 - There can be remnants of the product, even after the vessel becomes empty, and thus comply with all preventive actions of MSDS/labels.
 - Thoroughly wash the handled part after handling.
 - Use by being careful about handling and storage.
 - Be careful about the materials and conditions to be avoided.
- B) Safe storage method
- Completely discharge water from an empty drum, properly cover it, and then immediately return it to the drum adjuster or properly place it.
 - Store the vessel by thoroughly sealing it in a place with good ventilation.

8. Prevention of Exposure and Personal Protective equipment

- A) Exposure standards and biological exposure standards of chemical materials
- | | |
|-------------------------------|---------------------------|
| Domestic regulations | TWA – 10mg/m ³ |
| ACGIH regulations | No data available |
| Biological exposure standards | No data available |
| | No data available |
- B) Proper engineering management
- Use process segregation and local exhaust, or carry out other engineering Mgt controlling air level to below the exposure standard.
 - Ventilate to maintain air pollution to less than exposure standard, if dust, fume, or mist is generated upon operation.
 - For facility storage or using the material, install face washing equipment and safety shower facility.
- C) Personal protective equipment
- Respiratory system protection
- Wear protective equipment for breathing certified by KOHSA suitable for the material's physical and chemical characteristics in terms of exposed particles.
 - If exposure level is lower than 100 mg/m³, wear half-mask type respiratory protective equipment installed with proper type filter.
 - If exposure concentration is lower than 250 mg/m³, wear a loose-fitting hood /helmet type electric motor respiratory protective equipment or a consecutive flow-type dust mask equipped with a proper filter. (loose-fitting)
 - If exposure concentration is lower than 500 mg/m³, wear a full-mask or electric motor respiratory protective equipment, air supply type continuous flow type or pressure requiring type half-mask respiratory protective equipment equipped with a proper filter.
 - If exposure concentration is lower than 10000 mg/m³, wear a full-mask, helmet hood type, pressure requiring air supplied mask equipped with a proper filter.
 - If exposure concentration is lower than 100000 mg/m³, wear SCBA (self contained breathing apparatus) or pressure requiring SCBA respiratory protective equipment.
- | | |
|-----------------|-------------------|
| Eye protection | No data available |
| Hand protection | No data available |
| Body protection | No data available |

	Material Safety Data Sheet	Date of Preparation	Mar. 29, 2013
	[Material Safety Data Sheet]	Date of Revision	Mar. 19, 2019

9. Physical and Chemical Characteristics

A) Appearance	
State	Solid (crystal)
Color	Yellow, green, blue, black (according to purity)
B) Smell	No data available
C) † Threshold of smell	No data available
D) pH	No data available
E) Melting point/freezing point	No data available
F) Initial stage boiling point and range	No data available
G) Flashing point	No data available
H) Evaporation speed	No data available
I) Flammability (solid, gas)	Nonflammable
J) Upper limit/lower limit of flammable or explosion range	No data available
K) Steam pressure	No data available
L) Solubility	(Insolubility)
M) Steam density	No data available
N) Specific gravity	2.0
O) n-octanol/water distribution coefficient	No data available
P) Natural ignition temperature	No data available
Q) Decomposition temperature	No data available
R) Viscosity	No data available
S) Molecular weight	No data available

10. Stability and Reactivity

A) Chemical stability and harmful reaction possibility	<p>Toxic gas can be generated through decomposition at high temperature.</p> <p>The vessel can be exploded upon being heated.</p> <p>Although some can be burned, they are not easily flammable.</p> <p>Although nonflammable material is not burned, it may generate corrosive/toxic fume through decomposition upon being heated.</p>
B) Conditions to be avoided	Ignition sources including heat, spark, flame
C) Materials to be avoided	Flammable material and reducing material
D) Harmful materials generated upon decomposition	<p>Irritative and very toxic gas can be generated by pyrolysis or combustion during burning.</p> <p>Corrosive/toxic fume</p>

11. Information on Toxicity

A) Information on exposure path with a high possibility	No data available
B) Information on harmfulness to health	
Acute toxicity	No data available

	<h1>Material Safety Data Sheet</h1>	Date of Preparation	Mar. 29, 2013
	<h2>[Material Safety Data Sheet]</h2>	Date of Revision	Mar. 19, 2019

Oral	(Rat- female, and others: NOAEL=2000mg/kg bw, OECD Guideline 423, GLP)
Percutaneous	(Rat - female/male, NOAEL, 2000mg/kg bw, OECD Guideline 402, GLP)
Inhalation	(It was confirmed that no limited toxicity possibility existed as a result of inhalation acute toxicity experiment using rats.) In vitro: determination by a set of toxicity parameters (LDH, FDA) and through determination of inducible H2O2 release and in vivo: broncho-alveolar lavage (BAL) and BAL-fluid BALF)
Corrosive or irritative to skin	No irritation as a result of skin corrosive and irritative experiment using an animal (other guideline : OECD Guideline 402, GLP)
Severe eye damage or irritation	As a result of severe eye damage/irritation test, the material is chemical inactive, and there is a possibility of causing eye irritation due to large particles and shape. Rubefaction and pain as a result of acute eye experiment
Hypersensitive respiratory organ	No data available
Dermal hypersensitivity	No data available
Carcinogenic	
Occupational Safety and Health Act	No data available
Notification of the Labor Ministry	1B
IARC	2A
OSHA	No data available
ACGIH	A2
NTP	No data available
EU CLP	No data available
Mutagenicity of reproduction cell	Negative, irrelevant of metabolic activity as a result of atavism test (OECD Guideline 471, GLP). Negative in response to in vitro short-term mutation analysis of aluminum compound (similar material CAS No.1344-28-1), Titanium dioxide and in vitro genotoxicity Most research result is negative (similar material CAS No.13463-67-7)
Reproduction toxicity	No data available
Toxicity on specific target organ (1 time exposure)	As a result of target organ whole body toxicity, pulmonary edema, pulmonary hemorrhage, pneumonitis, collapsed bronchiole, and atelectasis symptoms are revealed. As a result of acute inhalation toxicity test, cough, glaucoma, and temporary increase in the number of white blood cells, and inflammation is caused in the bronchitis and lungs.
Toxicity on specific target organ (repeated exposure)	As a result of the repeated exposure test to target organ, -Pneumoconiosis, chest radiogram, lung fibrosis, change in knot, and silicosis observed. Chronic inflammation in the lung was discovered, and it was not applied to the classification in this item due to cancerigenic impact.
Harmfulness of inhalation	No data available
Other harmfulness impact	No data available

12. Impacts on the Environment

A) Ecological toxicity	
Fish	No data available
Crustaceans	No data available
Birds	No data available
B) Persistency and decomposability	
Persistency	No data available
Decomposability	No data available
C) Biological condensability	
Condensability	No data available
Bio degradability	No data available

	Material Safety Data Sheet	Date of Preparation	Mar. 29, 2013
	[Material Safety Data Sheet]	Date of Revision	Mar. 19, 2019

- D) Soil movability No data available
- E) Other harmful impacts Crustaceans: Daphnia magna, NOEC, 22d, $\geq 100\text{mg/L}$, OECD Guideline 211, GLP,
 ※ Source: ECHA

13. Cautions upon Scrapping

- A) How to scrap No data available
- B) Cautions upon scrapping (Scrap the vessel of the content (according to the specified details of the relevant laws and regulations).

14. Information Required for Transportation

- A) UN No. No UN transport-hazardous material classification information available
- B) B. Proper UN ship name N/A
- C) Hazard grade in transportation N/A
- D) Vessel grade N/A
- E. Marine pollutant N/A
- F) Things that uses need to know or any special safety measures in relation to transportation or transportation means
- Emergency action upon fire N/A
- Safety measures upon leakage N/A

15. Current Status of Legal Regulations

- A) Regulation by the Occupational Safety and Health Act Exposure standard-set material
 The material concerned CAS.NO: 409-21-2
- B) Regulation by the Chemical Mgt Act No data available
- C) Regulation by the Hazardous Materials Safety Mgt Act No data available
- D) Regulation by the Waste Mgt Act No data available
- E) Regulation by other Domestic and Foreign Acts
- Domestic regulations
- Other domestic regulation N/A
- Foreign regulation
- U.S. Mgt Information (OSHA Regulations) N/A.
- U.S. Mgt Information (CERCLA Regulations) N/A.
- U.S. Mgt Information (EPCRA 302 Regulations) N/A.
- U.S. Mgt Information (EPCRA 304 Regulations) N/A.
- U.S. Mgt Information (EPCRA 313 Regulations) N/A.
- U.S. Mgt Information (Materials under the Rotterdam Convention) N/A.
- U.S. Mgt Information (Materials under the Stockholm Convention) N/A.
- U.S. Mgt Information (Materials under the Montreal Protocol) N/A.
- EU Classification Information (confirmed classification result) N/A.
- EU Classification Information (hazard statement) N/A.

	Material Safety Data Sheet	Date of Preparation	Mar. 29, 2013
	[Material Safety Data Sheet]	Date of Revision	Mar. 19, 2019

EU Classification Information (safety statement)

N/A.

16. References

A) Data Sources

A. Data sources

ECHA (State_

ECHA (E. Melting point/Freezing point)

ICSC (I. Flammability (solid, gas)

ECHA (L. Solubility)

HSDB (N. Specific gravity)

JISHA (Q. Decomposition temperature)

Chemical book (S. Molecular weight)

ECHA (Oral)

ECI (<http://ull.chemistry.uakron.edu/erd>)

ECHA (Inhalation)

ECHA (Corrosive or irritative to skin)

ECHA, ICSC (Severe eye damage or irritation)

ECHA (Mutagenicity of reproduction cell)

NITE, ICSC, HSDB (Toxicity on specific target organ (1 time exposure)

NITE, HSDB (Toxicity on specific target organ (repeated exposure)

ECHA (E. Other harmful impacts)

B) Initial preparation date March 29, 2013

C) No. of revisions and last date of revision 5, March 19, 2019

D) Others

○ Although the MSDS was prepared on the basis of collectable information, we do not guarantee the included data, hazard, and toxicity evaluation.

Before using the product, investigate the organization that will use the product, and the laws and regulations of the area and country where it belongs.

Users need to comply with all laws and regulations for the safe handling and use of the product, and users are responsible for judging the conformity of the product in the intended usage.

All chemical products should be handled by users recognizing that they have unknown hazards and toxicity according to use or storage condition (period).

Any details contained herein shall not be a suggestion for product sales.