

SECTION 1: IDENTIFICATION OF THE SUBSTANCE / MIXTURE AND OF THE COMPANY / UNDERTAKING**1.1 Product identifier**

Trade name: **METAKAO™**
Registration number: NA
Synonym(s): Calcined clay, metakaolin
Preparation/Revision date: 9 March 2017

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses: Additive to enhance concrete and cement-based product performance
Uses advised against: None known

1.3 Details of the supplier of the safety data sheetManufacturer / Supplier

Company name: CARBO Ceramics Inc.
Address: 575 N. Dairy Ashford Road, Suite 300
Houston, Texas 77079, USA
Customer service: 1-337-367-6151

1.4 Emergency telephone number

For Chemical Emergency
Spill, Leak, Fire, Exposure, or Accident
Call CHEMTREC Day or Night
Within USA and Canada: 1-800-424-9300


SECTION 2: HAZARDS IDENTIFICATION**2.1 Classification of the substance or mixture**

This product has been assessed and/or tested for its physical, health and environmental hazards and the following classifications apply.

Classification according to the OSHA Hazard Communication Standard (29 CFR 1910.1200)

Classification: Carcinogenicity – Category 1A
STOT-Repeated Exposure – Category 1

SECTION 2: HAZARDS IDENTIFICATION (CONT'D)**2.2 Label elements**

Contains:	Crystalline silica – contains less than 3% respirable crystalline silica
Hazard pictogram:	
Signal word:	Danger
Hazard statement:	May cause cancer. May cause damage to lungs through prolonged or repeated inhalation.
Precautionary statements:	
- Prevention	Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not breathe dust. Wash exposed skin thoroughly after handling. Do not eat, drink or smoke when using this product. Wear protective clothing.
- Response:	If exposed or concerned: Get medical advice/attention. Get medical advice/attention if you feel unwell.
- Storage:	Store locked up.
- Disposal:	Dispose of contents / container in accordance with local, regional, national and international regulations.
Supplemental label information:	None

2.3 Other hazards

None known

Hazard summary

Physical hazards:	None known.
Health hazards:	May cause cancer. May cause damage to lungs through prolonged or repeated inhalation.
Environmental hazards:	None known.
Main symptoms:	May cause cancer. Prolonged or repeated inhalation of silica particles may cause scarring in the lungs, which can harm your ability to breathe. Ingestion may cause abdominal pain, vomiting, nausea, and diarrhea. May cause mechanical irritation of the skin, eyes, and mucous membranes.

SECTION 3: COMPOSITION / INFORMATION ON INGREDIENTS**3.1 Mixture**

Chemical Name	Percent	CAS No.	Notes
Partially calcined kaolin clay	97 - 100%	92704-41-1	
Respirable crystalline silica mixture	<3%		#*

#: This substance has workplace exposure limit(s)

*: Respirable Crystalline Silica consisting of Quartz (14808-60-7), Cristobalite (14464-46-1), and Tridymite (15468-32-3).

Composition comments: All concentrations are in percent by weight unless ingredients are a gas. Gas concentrations are in percent by volume.

SECTION 4: FIRST AID MEASURES**General Information**

Show this Safety Data Sheet to the medical professional in attendance. If symptoms occur, follow first aid measures as appropriate.

4.1 Description of first aid measures

Inhalation:	Remove to fresh air and keep comfortable to aid breathing. Get medical advice/attention if exposed or concerned.
Skin contact:	Wash with soap and water. Get medical attention if irritation develops or persists. Wash contaminated clothing before reuse.
Eye contact:	Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention immediately if irritation develops or persists.
Ingestion:	Rinse mouth. Do not induce vomiting. Get medical attention.
Notes to Physician:	Treat symptomatically.

4.2 Most important symptoms and effects, both acute and delayed

May cause cancer. Prolonged or repeated inhalation of silica particles cause scarring in the lungs, which can harm your ability to breathe.

4.3 Indication of any immediate medical attention and special treatment needed

Provide general supportive measures and treat symptoms as needed.

SECTION 5: FIRE FIGHTING MEASURES

General fire hazards This product is not flammable.

5.1 Extinguishing Media

Suitable extinguishing media: This product is not flammable.

Unsuitable extinguishing media: This product is not flammable.

5.2 Special hazards arising from the substance or mixture None known.

5.3 Advice for firefighters

Special protective equipment for firefighters: Use NIOSH approved self-contained breathing apparatus and full protective clothing.

Special firefighting procedures: None

Special remarks on fire hazards: None

SECTION 6: ACCIDENTAL RELEASE MEASURES**6.1 Personal precautions, protective equipment and emergency procedures**

For non-emergency personnel: Avoid dust formation. Do not breathe dusts. Use personal protective equipment as recommended in Section 8. Ensure adequate ventilation. Wash thoroughly after handling. Wear protective clothing.

For emergency responders: Use personal protection recommended in Section 8 of the SDS.

6.2 Environmental Precautions Environmental manager must be informed of all major releases. Avoid wind dispersal and fugitive dust generation. Avoid unintended release to the environment.

6.3 Methods and materials for containing and cleaning up Sweep up spilled substance and remove to safe place. Pick up and arrange for disposal without creating dust. Dispose of spilled material as indicated in Section 13. Store captured and reclaimed materials in suitable closed containers.

6.4 Reference to other Sections: For personal protection, see Section 8. For waste disposal, see Section 13.

SECTION 7: HANDLING AND STORAGE

- 7.1 Precautions for safe handling** Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Wear protective clothing. Do not breathe dust. Use only outdoors or in a well-ventilated areas. Wash thoroughly after handling.
- 7.2 Conditions for safe storage, including any incompatibilities** Store locked up in a well-ventilated place.
- 7.3 Specific end use(s)** Additive to enhance concrete and cement-based product performance.

SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Control parameters

United States. Occupational Exposure Limits:

Component	CAS No.	Type	Value	Form
Quartz, Cristobalite, Tridymite	14808-60-7, 14464-46-1, 15468-32-3	ACGIH TLV – TWA	0.025 mg/m ³	Respirable fraction
Quartz, Cristobalite, Tridymite	14808-60-7, 14464-46-1, 15468-32-3	NIOSH REL - TWA	0.05 mg/m ³	Respirable dust
Quartz, Cristobalite, Tridymite	14808-60-7, 14464-46-1, 15468-32-3	NIOSH REL - IDLH	50 mg/m ³	Respirable dust
Quartz [#]	14808-60-7	OSHA PEL - TWA	(30)/(%SiO ₂ + 2) mg/m ³	Total dust
Quartz [#]	14808-60-7	OSHA PEL - TWA	(250)/(%SiO ₂ + 5) mppcf	Respirable fraction
Quartz [#]	14808-60-7	OSHA PEL - TWA	(10)/(%SiO ₂ + 2) mg/m ³	Respirable fraction
Respirable crystalline silica*	N/A	OSHA PEL - TWA	50 µg/m ³	Respirable fraction

For Cristobalite and Tridymite, use ½ the value calculated from the count or mass formulae for quartz.

*Effective June 23 2016, after which industries have one to five years to comply. Construction industry June 23, 2017; general industry June 23, 2018; hydraulic fracturing June 23, 2018 for all provisions except Engineering Controls, which have a compliance date of June 23, 2021.

Consult local authorities for acceptable exposure limits

SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION (CONT'D)**8.2 Exposure Controls**

Appropriate engineering controls: Observe occupational exposure limits and prevent generation of dusts. Use process enclosures, local exhaust ventilation or other engineering controls to keep airborne levels below specified exposure limits. If user operations generate dust, fumes or mist, use ventilation to keep exposure to airborne particles below the exposure limit.

Individual Protective Measures

General Information: Personal protective equipment should be chosen according to applicable standards and in consultation with the supplier of the personal protective equipment.

Eye/face protection: Wear safety glasses with side shields or goggles. Avoid wearing contact lenses while handling.

Skin protection:

- Hand protection:

Wear protective gloves.

- Other:

Avoid direct contact with skin. Wear suitable chemical-resistant clothing to prevent contact with skin. The type of protective equipment should be selected according to the concentration and amount of the substance at the specific workplace. Wash skin after handling. Launder work clothes regularly.

Respiratory protection: Use respiratory protection in case of insufficient exhaust ventilation or prolonged exposure.

Thermal hazards: Not applicable

Hygiene measures

Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking and / or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

Environmental exposure controls

Environmental manager must be informed of all major releases. Avoid wind dispersal and fugitive dust generation. Avoid unintended release in to the environment.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Form	Solid	Explosive properties	Not applicable
Color	Tan to gray to white	Explosive limit	Not applicable
Odor	Odorless	Vapor pressure	Not applicable
Odor threshold	Not applicable	Vapor density	Not applicable
pH	4.8 (20% solids)	Evaporation rate	Not applicable
Melting/freezing point	Not available	Relative density	2.69
Boiling point, initial boiling point and boiling range	Not available	Partition coefficient (n-octanol/water)	Not available
Flash point	Not applicable	Solubility (water)	Insoluble
Auto-ignition temperature	Not available	Decomposition temperature	Not available
Flammability (solid, gas)	Not applicable	Bulk density	25 - 26 lb/ft ³ (loose) 32 - 33 lb/ft ³ (tapped)
Flammability limit-lower%	Not applicable	Viscosity	Not applicable
Flammability limit-upper%	Not applicable	VOC (weight %)	Not applicable
Oxidizing properties	Not applicable	Percent volatile	Not applicable

9.2 Other Information

No relevant additional information available

SECTION 10: STABILITY AND REACTIVITY

10.1 Reactivity

None known.

10.2 Chemical stability

Material is stable under normal conditions.

10.3 Possibility of hazardous reactions

Hazardous polymerization does not occur under normal conditions.

10.4 Conditions to avoid

None known.

10.5 Incompatible materials

None known.

10.6 Hazardous decompositions products

None known.

SECTION 11: TOXICOLOGICAL INFORMATION**General information on likely routes of exposure**

Ingestion:	May cause abdominal pain, vomiting, nausea and diarrhea.
Inhalation:	May cause cancer. Prolonged or repeated inhalation of silica particles may cause scarring in the lungs, which can harm the ability to breathe.
Skin contact:	May cause mechanical skin irritation.
Eye contact:	May cause mechanical eye irritation.
Symptoms:	May cause cancer. Prolonged or repeated inhalation of silica particles may cause scarring in the lungs, which can harm your ability to breathe. Ingestion may cause abdominal pain, vomiting, nausea, and diarrhea. May cause mechanical irritation of the skin, eyes, and mucous membranes.

11.1 Information on toxicological effects

Acute Toxicity: No data were identified for the product as a whole. Data are for constituents:

Product / ingredient name	Result	Species	Dose	Exposure
Partially calcined kaolin clay	LD ₅₀	Rat	> 2,000 mg/kg	Oral
Partially calcined kaolin clay	LC ₅₀	Rat	> 2.07 mg/L	4-Hour Inhalation
Quartz	LD ₅₀	Rat	500 mg/kg	Oral
Cristobalite	No data	No data	No data	No data
Tridymite	No data	No data	No data	No data

Serious Eye Damage/Irritation:	No components of the product are known to be irritating to the eyes. As with any foreign body, this material may cause mechanical irritation.
Skin corrosion/Irritation:	No components of the product are known to be skin irritants. As with any foreign body, this material may cause mechanical irritation.
Respiratory/Skin Sensitization:	No components of the product are known to be skin or respiratory sensitizers.
Germ Cell Mutagenicity:	No components of the product are known to be germ cell Mutagens.
Carcinogenicity:	Inhalation of respirable crystalline silica is known to cause cancer. According to the International Agency for Research on Cancer (IARC), crystalline silica inhaled in the form of quartz or cristobalite from occupational sources is carcinogenic to humans (Group 1). Crystalline silica of respirable size is classified by the National Toxicology Program (NTP) as a known human carcinogen. Crystalline silica is classified by the American Conference of Governmental Industrial Hygienists (ACGIH) as a suspected human carcinogen.
Reproductive Toxicity:	No components of the product are known to be reproductive toxins.

SECTION 11: TOXICOLOGICAL INFORMATION (CONT'D)

Developmental Effects:	No components of the product are known to be developmental toxins.
STOT – Single Exposure:	Limited data in animal studies showed pulmonary inflammatory effects following single exposures to aerosolized quartz/crystalline silica particles.
STOT – Repeated Exposure:	Prolonged and/or repeated exposure to respirable crystalline silica-containing dust may cause silicosis, a nodular pulmonary fibrosis caused by deposition in the lungs of fine respirable particles of crystalline silica. Prolonged inhalation of insoluble, respirable (less than 10 micron) dusts can lead to pulmonary damage.
Aspiration Hazard:	Not expected to be an aspiration hazard.
Conclusion/Summary	May cause cancer. Causes damage to lungs through prolonged or repeated inhalation.

SECTION 12: ECOLOGICAL INFORMATION

12.1 Toxicity / Aquatic ecotoxicity

Product / ingredient name	Test	Result (mg/L)	Species	Exposure
Partially calcined kaolin clay	LC ₅₀	>100	Fish (<i>Oncorhynchus mykiss</i>)	96 Hour
	EC ₅₀	>1	Crustacea (<i>Daphnia magna</i>)	48 Hour
	EC ₅₀	>100	Algae (<i>Desmodesmus subspicatus</i>)	72 Hour
Quartz	No data	No data	No data	No data
Cristobalite	No data	No data	No data	No data
Tridymite	No data	No data	No data	No data

12.2 Persistence and degradability	Product is not biodegradable with low solubility in water and is not expected to decompose in the environment.
12.3 Bioaccumulative potential	Product is not expected to bioaccumulate.
12.4 Mobility	No data available.
12.5 Results of PBT and vPvB assessment	Not a PBT or vPvB material .
12.6 Other adverse effects	None known.
Conclusion/Summary	This product is believed to be non-toxic in the environment.

SECTION 13: DISPOSAL CONSIDERATIONS**13.1 Waste treatment methods**

Residual waste:	Dispose of in accordance with all applicable regulations. Contact a licensed waste disposal company to ensure proper handling.
Contaminated packaging:	Empty containers should be taken to an approved waste handling site for recycling or disposal.
Disposal methods/information:	Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Dispose of contents / container in accordance with local, regional, national, international regulations.

Disposal should be in accordance with applicable regional, national and local laws and regulations.

SECTION 14: TRANSPORT INFORMATION

14.1 UN Number	Not regulated
14.2 UN proper shipping name	Not regulated
14.3 Transport hazard class(es)	Not regulated
14.4 Packing group	Not regulated
14.5 Environmental hazards	N/A
14.6 Special precautions for user	None
14.7 Transport in bulk according to Annex II MARPOL73/78 and the IBC Code	N/A

Product may be regulated for transport depending on package size and mode of transport.

SECTION 15: REGULATORY INFORMATION**Safety, health and environmental regulations/legislation specific for the substance or mixture****USA Federal Regulations**

29 CFR 1910.1200 Hazard Communication Standard (HCS):		Hazardous
TSCA - U.S. Inventory (TSCA 8b):		Exempt/Compliant
U.S. Clean Water Act (CWA) – Hazardous Substances:		None
SARA Title III – Section 302, Extremely Hazardous Substances (EHS):		None
CERCLA - Hazardous substances:		None
SARA Title III – 311/312, Hazard Classes:		
Fire / Flammability	No	
Reactivity	No	
Release of Pressure	No	
Acute Health Hazard	No	
Chronic Health Hazard	Yes	
SARA 313 – Toxic Chemicals:		None

USA State Regulations

California Prop 65:	Crystalline silica
Massachusetts – Right-to-Know:	Quartz, Tridymite, Cristobalite
New Jersey – Right-to-Know:	Quartz, Tridymite, Cristobalite
Pennsylvania – Right-to-Know:	Quartz, Tridymite, Cristobalite
Rhode Island– Right-to-Know:	Silica
WARNING: This product contains a chemical known to the State of California to cause cancer.	

Other Regulations: None specified

SECTION 16: OTHER INFORMATION**Label Requirements**

This product has been classified as hazardous and requires labeling.

List of abbreviations

ACGIH	American Conference of Governmental Industrial Hygienists
CAS	Chemical Abstract Service
CFR	Code of Federal Regulations
EC50	Effective Concentration (median)
IARC	International Agency for Research on Cancer
IDLH	Immediately Dangerous to Life and Health
LC50	Lethal Concentration (median)
LD50	Lethal Dose (median)
NIOSH	National Institute of Occupational Safety and Health
NTP	National Toxicology Program
OSHA	Occupational Safety and Health Administration (United States)
PEL	Permissible Exposure Limit
PBT	Persistent, Bioaccumulative and Toxic
SARA	Superfund Amendments and Reauthorization Act
SDS	Safety Data Sheet
TLV	Threshold Limit Value
TSCA	Toxic Substances Control Act
TWA	Time Weighted Average
vPvB	Very Persistent and Very Bioaccumulative

References

ChemAdvisor List of Lists (LOLI)
European Chemicals Agency (ECHA) Dissemination Portal

Information on evaluation method leading to the classification of mixture

The classification for health and environmental hazards is derived by a combination of calculation methods and test data, if available. For details refer to Sections 9, 11 and 12.

Training information

Follow training instructions when handling this material.

SDS Revisions

SDS prepared on 9 March 2017.

Disclaimer

The information in the sheet was written based on the best knowledge and experience currently available.