

SAFETY DATA SHEET

according to GB/T 16483 and GB/T 17519



Zircore™ Foundry Sand

Version	Revision Date:	SDS Number:	Date of last issue: 2023/04/12
10.0	2023/10/19	1331703-00046	Date of first issue: 2017/02/27

1. PRODUCT AND COMPANY IDENTIFICATION

Product name : Zircore™ Foundry Sand

SDS-Identcode : 130000028667

Manufacturer or supplier's details

Company : The Chemours Chemical (Shanghai) Co., Ltd.

Address : 9F, SCG Parkside, 868 Yinghua Road, Pudong New District
201204, Shanghai, China

Telephone : 86 400 8056 528

Emergency telephone number : 86 532 8388 9090

E-mail address : SDS.ChinaPSR@chemours.com

Telefax : 86 21 2612 0862

Recommended use of the chemical and restrictions on use

Recommended use : Metal casting
Foundry mould
Refractory barrier

Restrictions on use : Abrasive blasting
For industrial use only.

2. HAZARDS IDENTIFICATION

Emergency Overview

Appearance	: solid, dry, free flowing granules
Colour	: light brown
Odour	: odourless

Not a hazardous substance or mixture.

GHS Classification

Not a hazardous substance or mixture.

GHS label elements

No hazard pictogram, no signal word, no hazard statement(s), no precautionary statement(s) required

SAFETY DATA SHEET

according to GB/T 16483 and GB/T 17519



Zircore™ Foundry Sand

Version	Revision Date:	SDS Number:	Date of last issue: 2023/04/12
10.0	2023/10/19	1331703-00046	Date of first issue: 2017/02/27

Physical and chemical hazards

Not classified based on available information.

Health hazards

Not classified based on available information.

Environmental hazards

Not classified based on available information.

Other hazards which do not result in classification

None known.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Components

Chemical name	CAS-No.	Concentration (% w/w)
Zircon	14940-68-2	>= 50 -< 70
Kyanite	1302-76-7	>= 10 -< 20
Sillimanite	12141-45-6	>= 10 -< 20
Rutile (TiO ₂)	1317-80-2	>= 1 -< 10
Quartz	14808-60-7	>= 1 -< 10

4. FIRST AID MEASURES

If inhaled	: If inhaled, remove to fresh air. Get medical attention if symptoms occur.
In case of skin contact	: Wash with water and soap as a precaution. Get medical attention if symptoms occur.
In case of eye contact	: Flush eyes with water as a precaution. Get medical attention if irritation develops and persists.
If swallowed	: If swallowed, DO NOT induce vomiting. Get medical attention if symptoms occur. Rinse mouth thoroughly with water.
Most important symptoms and effects, both acute and delayed	: irritant effects
Protection of first-aiders	: No special precautions are necessary for first aid responders.
Notes to physician	: Treat symptomatically and supportively.

5. FIREFIGHTING MEASURES

SAFETY DATA SHEET

according to GB/T 16483 and GB/T 17519



Zircore™ Foundry Sand

Version 10.0	Revision Date: 2023/10/19	SDS Number: 1331703-00046	Date of last issue: 2023/04/12 Date of first issue: 2017/02/27
-----------------	------------------------------	------------------------------	---

- Suitable extinguishing media : Not applicable
Will not burn
- Unsuitable extinguishing media : Not applicable
Will not burn
- Specific hazards during fire-fighting : Exposure to combustion products may be a hazard to health.
- Hazardous combustion products : Metal oxides
Silicon oxides
- Specific extinguishing methods : Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Use water spray to cool unopened containers.
Remove undamaged containers from fire area if it is safe to do so.
Evacuate area.
- Special protective equipment for firefighters : Wear self-contained breathing apparatus for firefighting if necessary.
Use personal protective equipment.
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6. ACCIDENTAL RELEASE MEASURES

- Personal precautions, protective equipment and emergency procedures : Follow safe handling advice (see section 7) and personal protective equipment recommendations (see section 8).
- Environmental precautions : Prevent further leakage or spillage if safe to do so.
Retain and dispose of contaminated wash water.
Local authorities should be advised if significant spillages cannot be contained.
- Methods and materials for containment and cleaning up : Sweep up or vacuum up spillage and collect in suitable container for disposal.
Local or national regulations may apply to releases and disposal of this material, as well as those materials and items employed in the cleanup of releases. You will need to determine which regulations are applicable.
Sections 13 and 15 of this SDS provide information regarding certain local or national requirements.
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7. HANDLING AND STORAGE

Handling

- Technical measures : See Engineering measures under EXPOSURE CONTROLS/PERSONAL PROTECTION section.

SAFETY DATA SHEET

according to GB/T 16483 and GB/T 17519



Zircore™ Foundry Sand

Version	Revision Date:	SDS Number:	Date of last issue:
10.0	2023/10/19	1331703-00046	2023/04/12
			Date of first issue: 2017/02/27

Local/Total ventilation : Use only with adequate ventilation.

Advice on safe handling : Handle in accordance with good industrial hygiene and safety practice, based on the results of the workplace exposure assessment

Avoidance of contact : None.

Storage

Conditions for safe storage : Keep in properly labelled containers.
Store in accordance with the particular national regulations.

Materials to avoid : No special restrictions on storage with other products.

Packaging material : Unsuitable material: None known.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
Zircon	14940-68-2	PC-TWA	5 mg/m ³ (Zirconium)	CN OEL
		PC-STEL	10 mg/m ³ (Zirconium)	CN OEL
		TWA	5 mg/m ³ (Zirconium)	ACGIH
		STEL	10 mg/m ³ (Zirconium)	ACGIH
Kyanite	1302-76-7	TWA (Respirable particulate matter)	1 mg/m ³ (Aluminium)	ACGIH
Sillimanite	12141-45-6	TWA (Respirable particulate matter)	1 mg/m ³ (Aluminium)	ACGIH
Rutile (TiO ₂)	1317-80-2	TWA (Respirable particulate matter)	2.5 mg/m ³ (Titanium dioxide)	ACGIH
Quartz	14808-60-7	PC-TWA (Total dust)	0.5 mg/m ³	CN OEL
Further information: G1 - Carcinogenic to humans				
		PC-TWA (Respirable dust)	0.2 mg/m ³	CN OEL

SAFETY DATA SHEET

according to GB/T 16483 and GB/T 17519



Zircore™ Foundry Sand

Version 10.0	Revision Date: 2023/10/19	SDS Number: 1331703-00046	Date of last issue: 2023/04/12 Date of first issue: 2017/02/27
-----------------	------------------------------	------------------------------	---

Further information: G1 - Carcinogenic to humans				
		TWA (Respirable particulate matter)	0.025 mg/m ³ (Silica)	ACGIH

This substance(s) is not bioavailable and therefore does not contribute to a dust inhalation hazard.

Quartz

Engineering measures : Ensure adequate ventilation, especially in confined areas.
Minimize workplace exposure concentrations.

Personal protective equipment

Respiratory protection : If adequate local exhaust ventilation is not available or exposure assessment demonstrates exposures outside the recommended guidelines, use respiratory protection.

Filter type : Particulates type

Eye/face protection : Wear the following personal protective equipment:
Safety glasses

Skin and body protection : Skin should be washed after contact.

Hand protection
Material : Protective gloves

Remarks : Choose gloves to protect hands against chemicals depending on the concentration and quantity of the hazardous substance and specific to place of work. For special applications, we recommend clarifying the resistance to chemicals of the aforementioned protective gloves with the glove manufacturer. Wash hands before breaks and at the end of workday. Breakthrough time is not determined for the product. Change gloves often!

Hygiene measures : If exposure to chemical is likely during typical use, provide eye flushing systems and safety showers close to the working place.
When using do not eat, drink or smoke.
Wash contaminated clothing before re-use.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance : solid, dry, free flowing granules

SAFETY DATA SHEET

according to GB/T 16483 and GB/T 17519



Zircore™ Foundry Sand

Version	Revision Date:	SDS Number:	Date of last issue: 2023/04/12
10.0	2023/10/19	1331703-00046	Date of first issue: 2017/02/27

Colour	:	light brown
Odour	:	odourless
Odour Threshold	:	No data available
pH	:	No data available
Melting point/freezing point	:	> 1,815 °C
Initial boiling point and boiling range	:	No data available
Flash point	:	Not applicable
Evaporation rate	:	Not applicable
Flammability (solid, gas)	:	Will not burn
		Not expected to form explosive dust-air mixtures.
Upper explosion limit / Upper flammability limit	:	No data available
Lower explosion limit / Lower flammability limit	:	No data available
Vapour pressure	:	Not applicable
Relative vapour density	:	Not applicable
Relative density	:	3.6 - 4.2
Solubility(ies)		
Water solubility	:	insoluble
Partition coefficient: n-octanol/water	:	Not applicable
Auto-ignition temperature	:	No data available
Decomposition temperature	:	The substance or mixture is not classified self-reactive.
Viscosity		
Viscosity, kinematic	:	Not applicable
Explosive properties	:	Not explosive

SAFETY DATA SHEET

according to GB/T 16483 and GB/T 17519



Zircore™ Foundry Sand

Version	Revision Date:	SDS Number:	Date of last issue: 2023/04/12
10.0	2023/10/19	1331703-00046	Date of first issue: 2017/02/27

Oxidizing properties : The substance or mixture is not classified as oxidizing.

Particle size : No data available

10. STABILITY AND REACTIVITY

Reactivity : Not classified as a reactivity hazard.

Chemical stability : Stable under normal conditions.

Possibility of hazardous reactions : None known.

Conditions to avoid : None known.

Incompatible materials : None.

Hazardous decomposition products : No hazardous decomposition products are known.

11. TOXICOLOGICAL INFORMATION

Exposure routes : Skin contact
Ingestion
Eye contact

Acute toxicity

Not classified based on available information.

Components:

Zircon:

Acute oral toxicity : LD50 (Mouse): > 200,000 mg/kg

Kyanite:

Acute oral toxicity : LD50 (Rat, female): > 2,000 mg/kg
Method: OECD Test Guideline 423
Remarks: Based on data from similar materials

Acute inhalation toxicity : LC50 (Rat): > 1 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Remarks: Based on data from similar materials

Acute dermal toxicity : LD50 (Rat): > 5,000 mg/kg
Remarks: Based on data from similar materials

SAFETY DATA SHEET

according to GB/T 16483 and GB/T 17519



Zircore™ Foundry Sand

Version	Revision Date:	SDS Number:	Date of last issue: 2023/04/12
10.0	2023/10/19	1331703-00046	Date of first issue: 2017/02/27

Sillimanite:

Acute oral toxicity	: LD50 (Rat): > 5,000 mg/kg Remarks: Based on data from similar materials
Acute dermal toxicity	: LD50 (Rabbit): > 5,000 mg/kg Method: OECD Test Guideline 402 Remarks: Based on data from similar materials

Rutile (TiO₂):

Acute oral toxicity	: LD50 (Rat): > 5,000 mg/kg Method: OECD Test Guideline 425 Remarks: Based on data from similar materials
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Quartz:

Acute oral toxicity	: LD50 (Rat): > 5,000 mg/kg
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Skin corrosion/irritation

Not classified based on available information.

Components:

Zircon:

Species	: Rabbit
Method	: OECD Test Guideline 404
Result	: No skin irritation
Remarks	: Based on data from similar materials

Kyanite:

Species	: Rabbit
Method	: OECD Test Guideline 404
Result	: No skin irritation
Remarks	: Based on data from similar materials

Sillimanite:

Species	: Rabbit
Result	: No skin irritation
Remarks	: Based on data from similar materials

Rutile (TiO₂):

Species	: Rabbit
Method	: OECD Test Guideline 404
Result	: No skin irritation
Remarks	: Information given is based on data obtained from similar substances.

SAFETY DATA SHEET

according to GB/T 16483 and GB/T 17519



Zircore™ Foundry Sand

Version	Revision Date:	SDS Number:	Date of last issue: 2023/04/12
10.0	2023/10/19	1331703-00046	Date of first issue: 2017/02/27

Serious eye damage/eye irritation

Not classified based on available information.

Components:

Zircon:

Result	: No eye irritation
Remarks	: Based on data from similar materials

Kyanite:

Species	: Rabbit
Result	: No eye irritation
Method	: OPPTS 870.2400
Remarks	: Based on data from similar materials

Sillimanite:

Species	: Rabbit
Result	: No eye irritation
Remarks	: Based on data from similar materials

Rutile (TiO₂):

Species	: Rabbit
Result	: No eye irritation
Method	: OECD Test Guideline 405
Remarks	: Based on data from similar materials

Respiratory or skin sensitisation

Skin sensitisation

Not classified based on available information.

Respiratory sensitisation

Not classified based on available information.

Components:

Zircon:

Test Type	: Maximisation Test
Exposure routes	: Skin contact
Species	: Guinea pig
Method	: OECD Test Guideline 406
Result	: negative
Remarks	: Based on data from similar materials

Kyanite:

Test Type	: Local lymph node assay (LLNA)
Exposure routes	: Skin contact
Species	: Mouse
Method	: OECD Test Guideline 429

SAFETY DATA SHEET

according to GB/T 16483 and GB/T 17519



Zircore™ Foundry Sand

Version	Revision Date:	SDS Number:	Date of last issue: 2023/04/12
10.0	2023/10/19	1331703-00046	Date of first issue: 2017/02/27

Result	: negative
Remarks	: Based on data from similar materials

Rutile (TiO₂):

Exposure routes	: Skin contact
Species	: Mouse
Method	: OECD Test Guideline 429
Result	: negative
Remarks	: Based on data from similar materials

Germ cell mutagenicity

Not classified based on available information.

Components:

Zircon:

Genotoxicity in vitro	: Test Type: Bacterial reverse mutation assay (AMES) Method: OECD Test Guideline 471 Result: negative Remarks: Based on data from similar materials
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Kyanite:

Genotoxicity in vitro	: Test Type: Bacterial reverse mutation assay (AMES) Result: negative Remarks: Based on data from similar materials Test Type: In vitro mammalian cell gene mutation test Method: OECD Test Guideline 476 Result: negative Remarks: Based on data from similar materials Test Type: Chromosome aberration test in vitro Method: OECD Test Guideline 476 Result: negative Remarks: Based on data from similar materials
Genotoxicity in vivo	: Test Type: Mutagenicity (in vivo mammalian bone-marrow cytogenetic test, chromosomal analysis) Species: Rat Application Route: Ingestion Result: negative Remarks: Based on data from similar materials

Sillimanite:

Genotoxicity in vitro	: Test Type: Bacterial reverse mutation assay (AMES) Method: OECD Test Guideline 471 Result: negative Remarks: Based on data from similar materials
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SAFETY DATA SHEET

according to GB/T 16483 and GB/T 17519



Zircore™ Foundry Sand

Version	Revision Date:	SDS Number:	Date of last issue:
10.0	2023/10/19	1331703-00046	2023/04/12
			Date of first issue: 2017/02/27

		Test Type: In vitro mammalian cell gene mutation test
		Method: OECD Test Guideline 476
		Result: negative
		Remarks: Based on data from similar materials
		Test Type: Chromosome aberration test in vitro
		Method: OECD Test Guideline 473
		Result: negative
		Remarks: Based on data from similar materials
	Genotoxicity in vivo	:
		Species: Rat
		Application Route: Ingestion
		Method: OECD Test Guideline 475
		Result: negative
		Remarks: Based on data from similar materials

Rutile (TiO₂):

Germ cell mutagenicity - Assessment	:	Weight of evidence does not support classification as a germ cell mutagen.
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Carcinogenicity

Not classified based on available information.

Components:

Kyanite:

Species	:	Rat
Application Route	:	Ingestion
Exposure time	:	103 weeks
Result	:	negative
Remarks	:	Based on data from similar materials

Sillimanite:

Species	:	Rat
Application Route	:	Ingestion
Exposure time	:	103 weeks
Method	:	OECD Test Guideline 453
Result	:	negative
Remarks	:	Based on data from similar materials

Rutile (TiO₂):

Carcinogenicity - Assessment	:	Weight of evidence does not support classification as a carcinogen
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Quartz:

Species	:	Humans
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SAFETY DATA SHEET

according to GB/T 16483 and GB/T 17519



Zircore™ Foundry Sand

Version	Revision Date:	SDS Number:	Date of last issue: 2023/04/12
10.0	2023/10/19	1331703-00046	Date of first issue: 2017/02/27

Application Route	: inhalation (dust/mist/fume)
Result	: positive
Remarks	: This substance(s) is not bioavailable and therefore does not contribute to a dust inhalation hazard.

Carcinogenicity - Assessment	: Positive evidence from human epidemiological studies (inhalation)
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Reproductive toxicity

Not classified based on available information.

Components:

Kyanite:

Effects on foetal development	: Test Type: Embryo-foetal development Species: Rabbit Application Route: Ingestion Result: negative Remarks: Based on data from similar materials
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Sillimanite:

Effects on fertility	: Test Type: One-generation reproduction toxicity study Species: Rat Application Route: Ingestion Result: negative Remarks: Based on data from similar materials
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Effects on foetal development	: Test Type: Embryo-foetal development Species: Rabbit Application Route: Ingestion Result: negative Remarks: Based on data from similar materials
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Rutile (TiO₂):

Reproductive toxicity - Assessment	: Weight of evidence does not support classification for reproductive toxicity
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STOT - single exposure

Not classified based on available information.

STOT - repeated exposure

Not classified based on available information.

Components:

Rutile (TiO₂):

Assessment	: No significant health effects observed in animals at concentrations of 100 mg/kg bw or less.
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SAFETY DATA SHEET

according to GB/T 16483 and GB/T 17519



Zircore™ Foundry Sand

Version	Revision Date:	SDS Number:	Date of last issue: 2023/04/12
10.0	2023/10/19	1331703-00046	Date of first issue: 2017/02/27

Quartz:

Exposure routes	: inhalation (dust/mist/fume)
Target Organs	: Lungs
Assessment	: Shown to produce significant health effects in animals at concentrations of 0.02 mg/l/6h/d or less.

Repeated dose toxicity

Components:

Zircon:

Species	: Rat
NOAEL	: > 100 mg/kg
Application Route	: Ingestion
Exposure time	: 17 Weeks
Remarks	: Based on data from similar materials

Kyanite:

Species	: Rat
NOAEL	: 1,760 mg/kg
Application Route	: Ingestion
Exposure time	: 103 Weeks
Remarks	: Based on data from similar materials

Sillimanite:

Species	: Rat
NOAEL	: 2,500 mg/kg
Application Route	: Ingestion
Exposure time	: 2 yr
Method	: OECD Test Guideline 452
Remarks	: Based on data from similar materials

Rutile (TiO₂):

Species	: Rat
NOAEL	: 24,000 mg/kg
LOAEL	: > 24,000 mg/kg
Application Route	: Ingestion
Exposure time	: 28 d
Remarks	: No significant adverse effects were reported Based on data from similar materials

Quartz:

Species	: Humans
LOAEL	: 0.053 mg/m ³
Application Route	: inhalation (dust/mist/fume)
Remarks	: This substance(s) is not bioavailable and therefore does not contribute to a dust inhalation hazard.

SAFETY DATA SHEET

according to GB/T 16483 and GB/T 17519



Zircore™ Foundry Sand

Version	Revision Date:	SDS Number:	Date of last issue: 2023/04/12
10.0	2023/10/19	1331703-00046	Date of first issue: 2017/02/27

Aspiration toxicity

Not classified based on available information.

12. ECOLOGICAL INFORMATION

Ecotoxicity

Components:

Zircon:

Toxicity to daphnia and other aquatic invertebrates	: EL50 (Daphnia magna (Water flea)): > 100 mg/l Exposure time: 48 h Test substance: Water Accommodated Fraction Method: OECD Test Guideline 202 Remarks: Based on data from similar materials
Toxicity to algae/aquatic plants	: EL50 (Raphidocelis subcapitata (freshwater green alga)): > 100 mg/l Exposure time: 72 h Test substance: Water Accommodated Fraction Method: OECD Test Guideline 201 Remarks: Based on data from similar materials
	NOELR (Raphidocelis subcapitata (freshwater green alga)): > 1 mg/l Exposure time: 72 h Test substance: Water Accommodated Fraction Method: OECD Test Guideline 201 Remarks: Based on data from similar materials

Kyanite:

Toxicity to fish	: LL50 (Danio rerio (zebra fish)): > 100 mg/l Exposure time: 96 h Test substance: Water Accommodated Fraction Method: OECD Test Guideline 203 Remarks: Based on data from similar materials
Toxicity to daphnia and other aquatic invertebrates	: EC50 (Daphnia magna (Water flea)): > 100 mg/l Exposure time: 48 h Test substance: Water Accommodated Fraction Remarks: Based on data from similar materials
Toxicity to algae/aquatic plants	: EL50 (Desmodesmus subspicatus (green algae)): > 100 mg/l Exposure time: 72 h Test substance: Water Accommodated Fraction Method: OECD Test Guideline 201 Remarks: Based on data from similar materials
	EC10 (Desmodesmus subspicatus (green algae)): > 1 mg/l

SAFETY DATA SHEET

according to GB/T 16483 and GB/T 17519



Zircore™ Foundry Sand

Version 10.0	Revision Date: 2023/10/19	SDS Number: 1331703-00046	Date of last issue: 2023/04/12 Date of first issue: 2017/02/27
-----------------	------------------------------	------------------------------	---

	Exposure time: 72 h Test substance: Water Accommodated Fraction Method: OECD Test Guideline 201 Remarks: Based on data from similar materials
Toxicity to fish (Chronic toxicity)	: NOELR (Oncorhynchus mykiss (rainbow trout)): > 1 mg/l Exposure time: 30 d Test substance: Water Accommodated Fraction Remarks: Based on data from similar materials
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	: NOELR (Daphnia magna (Water flea)): > 1 mg/l Exposure time: 21 d Test substance: Water Accommodated Fraction Method: OECD Test Guideline 211 Remarks: Based on data from similar materials
Toxicity to microorganisms	: EL50 (Pseudomonas putida): > 100 mg/l Exposure time: 16 h Test substance: Water Accommodated Fraction Method: DIN 38 412 Part 8 Remarks: Based on data from similar materials

Sillimanite:

Toxicity to fish	: LL50 (Danio rerio (zebra fish)): > 100 mg/l Exposure time: 96 h Test substance: Water Accommodated Fraction Method: OECD Test Guideline 203 Remarks: Based on data from similar materials
Toxicity to daphnia and other aquatic invertebrates	: EL50 (Daphnia magna (Water flea)): > 100 mg/l Exposure time: 48 h Test substance: Water Accommodated Fraction Method: OECD Test Guideline 202 Remarks: Based on data from similar materials
Toxicity to algae/aquatic plants	: EL50 (Desmodesmus subspicatus (green algae)): > 100 mg/l Exposure time: 72 h Test substance: Water Accommodated Fraction Method: OECD Test Guideline 201 Remarks: Based on data from similar materials
	NOELR (Desmodesmus subspicatus (green algae)): > 1 mg/l Exposure time: 72 h Test substance: Water Accommodated Fraction Method: OECD Test Guideline 201 Remarks: Based on data from similar materials

Rutile (TiO₂):

Toxicity to fish	: LC50 (Pimephales promelas (fathead minnow)): > 1,000 mg/l Exposure time: 96 h
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SAFETY DATA SHEET

according to GB/T 16483 and GB/T 17519



Zircore™ Foundry Sand

Version	Revision Date:	SDS Number:	Date of last issue: 2023/04/12
10.0	2023/10/19	1331703-00046	Date of first issue: 2017/02/27

	Remarks: Based on data from similar materials
Toxicity to daphnia and other aquatic invertebrates	: EC50 (Daphnia magna (Water flea)): > 100 mg/l Exposure time: 48 h Method: OECD Test Guideline 202 Remarks: Based on data from similar materials
Toxicity to algae/aquatic plants	: ErC50 (algae): > 10,000 mg/l Exposure time: 72 h Remarks: Based on data from similar materials
	NOEC (algae): 5,600 mg/l Exposure time: 72 h Remarks: Based on data from similar materials

Quartz:

Ecotoxicology Assessment

Acute aquatic toxicity	: No toxicity at the limit of solubility
Chronic aquatic toxicity	: No toxicity at the limit of solubility

Persistence and degradability

No data available

Bioaccumulative potential

Components:

Rutile (TiO₂):

Bioaccumulation	: Remarks: Bioaccumulation is unlikely. Based on data from similar materials
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Mobility in soil

No data available

Other adverse effects

No data available

13. DISPOSAL CONSIDERATIONS

Disposal methods

Waste from residues	: Do not dispose of waste into sewer. Dispose of in accordance with local regulations.
Contaminated packaging	: Empty containers should be taken to an approved waste handling site for recycling or disposal. If not otherwise specified: Dispose of as unused product.

SAFETY DATA SHEET

according to GB/T 16483 and GB/T 17519



Zircore™ Foundry Sand

Version	Revision Date:	SDS Number:	Date of last issue: 2023/04/12
10.0	2023/10/19	1331703-00046	Date of first issue: 2017/02/27

14. TRANSPORT INFORMATION

International Regulations

UNRTDG

UN number	:	Not applicable
Proper shipping name	:	Not applicable
Class	:	Not applicable
Subsidiary risk	:	Not applicable
Packing group	:	Not applicable
Labels	:	Not applicable

IATA-DGR

UN/ID No.	:	Not applicable
Proper shipping name	:	Not applicable
Class	:	Not applicable
Subsidiary risk	:	Not applicable
Packing group	:	Not applicable
Labels	:	Not applicable
Packing instruction (cargo aircraft)	:	Not applicable
Packing instruction (passenger aircraft)	:	Not applicable

IMDG-Code

UN number	:	Not applicable
Proper shipping name	:	Not applicable
Class	:	Not applicable
Subsidiary risk	:	Not applicable
Packing group	:	Not applicable
Labels	:	Not applicable
EmS Code	:	Not applicable
Marine pollutant	:	Not applicable

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable for product as supplied.

National Regulations

GB 6944/12268

UN number	:	Not applicable
Proper shipping name	:	Not applicable
Class	:	Not applicable
Subsidiary risk	:	Not applicable
Packing group	:	Not applicable
Labels	:	Not applicable

Special precautions for user

Not applicable

SAFETY DATA SHEET

according to GB/T 16483 and GB/T 17519



Zircore™ Foundry Sand

Version	Revision Date:	SDS Number:	Date of last issue: 2023/04/12
10.0	2023/10/19	1331703-00046	Date of first issue: 2017/02/27

15. REGULATORY INFORMATION

National regulatory information

Law on the Prevention and Control of Occupational Diseases

Yangtze River Protection Law

This product does not contain any dangerous chemicals prohibited for inland river transport.

16. OTHER INFORMATION

Revision Date : 2023/10/19

Other information : Zircore™ and any associated logos are trademarks or copyrights of The Chemours Company FC, LLC.
Chemours™ and the Chemours Logo are trademarks of The Chemours Company.
Before use read Chemours safety information.
For further information contact the local Chemours office or nominated distributors.
Do not use or resell Chemours™ materials in medical applications involving implantation in the human body or contact with internal body fluids or tissues unless agreed to by Seller in a written agreement covering such use. For further information, please contact your Chemours representative.
This product contains Naturally Occurring Radioactive Materials (NORMs) at levels below U.S. Nuclear Regulatory Commission licensing requirements at 10 CFR 40. Many local jurisdictions are developing new regulations for the disposal of waste containing Naturally Occurring Radioactive Materials (NORM) or Technologically Enhanced Naturally Occurring Radioactive Materials (TENORM) above background levels. Consult and comply with current regulations.
The main radiological hazard from the product is internal exposure from small amounts of alpha particles given off by inhaled dust. Industrial hygiene practices aimed at control of airborne dust can lessen the potential for exposure. Overexposure by inhalation to inhaled dusts containing radioactive uranium, thorium, and radium may cause lung cancer. Low level gamma radiation in proximity to bulk or bagged stockpiles of these products may present a lesser, external exposure that can be managed by limiting close proximity for long time periods to large volumes of material.
With respect to dust exposure, evaluation and calculation based upon dosimetry (ICRP 68) yield the following guidance to ensure that inhalation intake is less than a 100 mrem/yr public dose reference point for radionuclides.
For a total dust with aerodynamic diameter of 1 µm, the calculated reference dust level is 2.3 mg/m³. For a total dust with aerodynamic diameter of 5 µm, the calculated reference dust

SAFETY DATA SHEET

according to GB/T 16483 and GB/T 17519



Zircore™ Foundry Sand

Version	Revision Date:	SDS Number:	Date of last issue:
10.0	2023/10/19	1331703-00046	2023/04/12
			Date of first issue: 2017/02/27

level is 3.3 mg/m³. For a total dust with aerodynamic diameter of 10 µm, the calculated reference dust level is 5.2 mg/m³. The stated hazards of this material are based on non-inhalable particles that are the bulk fraction of the delivered product. However, if during handling or use the particles are broken down to the inhalable or respirable size range, the dusts may be harmful to the respiratory system. Respirable quartz is an IARC Category 1 carcinogen and applicable exposure limits should be referenced.

The calculations noted above are based upon 8 hr/day TWAs. It should be noted that for these products, the actual particle physical diameter is approximately 1/2 the effective aerodynamic diameter. For these products, as shipped, with essentially no particles as small as calculated above, the highest total dust level can provide a conservative limit. However, if during handling or use the particles are broken down to finer particle sizes, lower levels of total dust would apply.

These reference calculations for radionuclides may or may not provide the most conservative recommendation vs. other trace contaminants as compared to specific country dust contaminant limit calculations. It is recommended that the user compare and calculate or measure for specific contaminants vs. reference limits, especially if particles are broken down, to determine the most appropriate standard for protection.

Further information

Sources of key data used to compile the Safety Data Sheet : Internal technical data, data from raw material SDSs, OECD eChem Portal search results and European Chemicals Agency, <http://echa.europa.eu/>

Items where changes have been made to the previous version are highlighted in the body of this document by two vertical lines.

Date format : yyyy/mm/dd

Full text of other abbreviations

ACGIH : USA. ACGIH Threshold Limit Values (TLV)
CN OEL : Occupational exposure limits for hazardous agents in the workplace - Chemical hazardous agents.

ACGIH / TWA : 8-hour, time-weighted average
ACGIH / STEL : Short-term exposure limit
CN OEL / PC-TWA : Permissible concentration - time weighted average
CN OEL / PC-STEEL : Permissible concentration - short term exposure limit

AIIC - Australian Inventory of Industrial Chemicals; ANTT - National Agency for Transport by Land of Brazil; ASTM - American Society for the Testing of Materials; bw - Body weight; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule;

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ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; Nch - Chilean Norm; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NOM - Official Mexican Norm; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TDG - Transportation of Dangerous Goods; TECI - Thailand Existing Chemicals Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative; WHMIS - Workplace Hazardous Materials Information System

Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and shall not be considered a warranty or quality specification of any type. The information provided relates only to the specific material identified at the top of this SDS and may not be valid when the SDS material is used in combination with any other materials or in any process, unless specified in the text. Material users should review the information and recommendations in the specific context of their intended manner of handling, use, processing and storage, including an assessment of the appropriateness of the SDS material in the user's end product, if applicable.

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