

SAFETY DATA SHEET

according to the OSHA Hazard Communication Standard



Zircore™ Foundry Sand

Version 11.0 Revision Date: 10/19/2023 SDS Number: 1331710-00049 Date of last issue: 04/12/2023
Date of first issue: 02/27/2017

SECTION 1. IDENTIFICATION

Product name : Zircore™ Foundry Sand

SDS-Identcode : 130000028667

Manufacturer or supplier's details

Company name of supplier : The Chemours Company FC, LLC

Address : 1007 Market Street
Wilmington, DE 19801 United States of America (USA)

Telephone : 1-844-773-CHEM (outside the U.S. 1-302-773-1000)

Emergency telephone : Medical emergency: 1-866-595-1473 (outside the U.S. 1-302-773-2000) ; Transport emergency: +1-800-424-9300 (outside the U.S. +1-703-527-3887)

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.

SECTION 2. HAZARDS IDENTIFICATION

GHS classification in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200)

Not a hazardous substance or mixture.

GHS label elements

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

Other hazards

None known.

SECTION 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 | >= 5 - < 10 |

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| | | |
|--|------------|------------|
| Corundum | 1302-74-5 | >= 1 - < 5 |
| Quartz | 14808-60-7 | >= 1 - < 5 |
| Actual concentration is withheld as a trade secret | | |

SECTION 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. |

SECTION 5. FIRE-FIGHTING MEASURES

- | | |
|--|---|
| 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 fire-fighters | : Wear self-contained breathing apparatus for firefighting if necessary. Use personal protective equipment. |

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SECTION 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.

SECTION 7. HANDLING AND STORAGE

- Technical measures : See Engineering measures under EXPOSURE CONTROLS/PERSONAL PROTECTION section.
- 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
- Conditions for safe storage : Keep in properly labeled containers. Store in accordance with the particular national regulations.
- Materials to avoid : No special restrictions on storage with other products.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ingredients with workplace control parameters

| Components | CAS-No. | Value type (Form of exposure) | Control parameters / Permissible concentration | Basis |
|------------|------------|-------------------------------|--|-----------|
| Zircon | 14940-68-2 | TWA | 5 mg/m ³ (Zirconium) | OSHA Z-1 |
| | | TWA | 5 mg/m ³ (Zirconium) | ACGIH |
| | | STEL | 10 mg/m ³ (Zirconium) | ACGIH |
| | | TWA | 5 mg/m ³ (Zirconium) | NIOSH REL |
| | | ST | 10 mg/m ³ | NIOSH REL |

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|----------------------------|------------|-------------------------------------|---|-----------|
| | | | (Zirconium) | |
| Kyanite | 1302-76-7 | TWA (Respirable particulate matter) | 1 mg/m ³ (Aluminum) | ACGIH |
| Sillimanite | 12141-45-6 | TWA (Respirable particulate matter) | 1 mg/m ³ (Aluminum) | ACGIH |
| Rutile (TiO ₂) | 1317-80-2 | TWA (Respirable particulate matter) | 2.5 mg/m ³ (Titanium dioxide) | ACGIH |
| Quartz | 14808-60-7 | TWA (Respirable dust) | 0.05 mg/m ³ | OSHA Z-1 |
| | | TWA (respirable) | 10 mg/m ³ / %SiO ₂ +2 | OSHA Z-3 |
| | | TWA (respirable) | 250 mppcf / %SiO ₂ +5 | OSHA Z-3 |
| | | TWA (Respirable particulate matter) | 0.025 mg/m ³ (Silica) | ACGIH |
| | | TWA (Respirable dust) | 0.05 mg/m ³ (Silica) | NIOSH REL |
| | | PEL (respirable) | 0.05 mg/m ³ | OSHA CARC |

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 : General and local exhaust ventilation is recommended to maintain vapor exposures below recommended limits. Where concentrations are above recommended limits or are unknown, appropriate respiratory protection should be worn. Follow OSHA respirator regulations (29 CFR 1910.134) and use NIOSH/MSHA approved respirators. Protection provided by air purifying respirators against exposure to any hazardous chemical is limited. Use a positive pressure air supplied respirator if there is any potential for uncontrolled release, exposure levels are unknown, or any other circumstance where air purifying respirators may not provide adequate protection.

Hand protection
Material : Protective gloves

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| | |
|--------------------------|---|
| Remarks | : Choose gloves to protect hands against chemicals depending on the concentration 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! |
| Eye protection | : Wear the following personal protective equipment: Safety glasses |
| Skin and body protection | : Skin should be washed after contact. |
| 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. |

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

| | |
|--|--|
| Appearance | : solid, dry, free flowing granules |
| Color | : light brown |
| Odor | : odorless |
| Odor Threshold | : No data available |
| pH | : No data available |
| Melting point/freezing point | : > 3,299 °F / > 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 |

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| | | |
|--|---|---|
| Lower explosion limit / Lower flammability limit | : | No data available |
| Vapor pressure | : | Not applicable |
| Relative vapor density | : | Not applicable |
| Relative density | : | 3.6 - 4.2 |
| Solubility(ies) Water solubility | : | insoluble |
| Partition coefficient: n-octanol/water | : | Not applicable |
| Autoignition temperature | : | No data available |
| Decomposition temperature | : | The substance or mixture is not classified self-reactive. |
| Viscosity Viscosity, kinematic | : | Not applicable |
| Explosive properties | : | Not explosive |
| Oxidizing properties | : | The substance or mixture is not classified as oxidizing. |
| Particle size | : | No data available |

SECTION 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. |

SECTION 11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Skin contact
Ingestion
Eye contact

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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

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

Corundum:

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

Acute inhalation toxicity : LC50 (Rat): > 2.3 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Remarks: Based on data from similar materials

Quartz:

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

Skin corrosion/irritation

Not classified based on available information.

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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. |

Corundum:

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

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 |

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||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

Corundum:

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

Respiratory or skin sensitization

Skin sensitization

Not classified based on available information.

Respiratory sensitization

Not classified based on available information.

Components:

Zircon:

||Test Type : Maximization Test
||Routes of exposure : 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)
||Routes of exposure : Skin contact
||Species : Mouse
||Method : OECD Test Guideline 429
||Result : negative
||Remarks : Based on data from similar materials

Rutile (TiO₂):

||Routes of exposure : Skin contact
||Species : Mouse
||Method : OECD Test Guideline 429
||Result : negative
||Remarks : Based on data from similar materials

Corundum:

||Test Type : Draize Test
||Routes of exposure : Skin contact
||Species : Guinea pig

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| | |
|---------|--|
| Result | : negative |
| Remarks | : Based on data from similar materials |

| | |
|--------------------|--|
| Routes of exposure | : Inhalation |
| Species | : Mouse |
| 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 |
|-----------------------|--|

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 Test Type: In vitro mammalian cell gene mutation test Method: OECD Test Guideline 476 Result: negative Remarks: Based on data from similar materials |
|-----------------------|---|

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| | |
|----------------------|--|
| | Test Type: Chromosome aberration test in vitro Method: OECD Test Guideline 473 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 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. |
|-------------------------------------|--|

Corundum:

| | |
|-----------------------|--|
| Genotoxicity in vitro | : Test Type: In vitro mammalian cell gene mutation test Method: OECD Test Guideline 476 Result: negative Remarks: Based on data from similar materials |
| Genotoxicity in vivo | : Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay) Species: Rat Application Route: Ingestion Method: OECD Test Guideline 474 Result: negative Remarks: Based on data from similar materials |

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 |

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Rutile (TiO₂):

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

Corundum:

Species : Rat
Application Route : inhalation (dust/mist/fume)
Exposure time : 6- 12 Months
Result : negative
Remarks : Based on data from similar materials

Quartz:

Species : Humans
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)

| | | |
|-------------|--|------------|
| IARC | Group 1: Carcinogenic to humans | |
| | Quartz (Silica dust, crystalline) | 14808-60-7 |
| | Group 2B: Possibly carcinogenic to humans | |
| | Rutile (TiO ₂) | 1317-80-2 |
| OSHA | OSHA specifically regulated carcinogen | |
| | Quartz (crystalline silica) | 14808-60-7 |
| NTP | Known to be human carcinogen | |
| | Quartz (Silica, Crystalline (Respirable Size)) | 14808-60-7 |

Reproductive toxicity

Not classified based on available information.

Components:

Kyanite:

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

Sillimanite:

Effects on fertility : Test Type: One-generation reproduction toxicity study
Species: Rat

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Application Route: Ingestion
Result: negative
Remarks: Based on data from similar materials

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

Rutile (TiO₂):

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

Corundum:

Effects on fertility : Test Type: One-generation reproduction toxicity study
Species: Rat
Application Route: Ingestion
Result: negative
Remarks: Based on data from similar materials

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

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.

Corundum:

Assessment : No significant health effects observed in animals at concentrations of 0.2 mg/l/6h/d or less.

Quartz:

Routes of exposure : 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.

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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 y |
| 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 |

Corundum:

| | |
|-------------------|--|
| Species | : Rat |
| NOAEL | : 0.07 mg/l |
| Application Route | : inhalation (dust/mist/fume) |
| Exposure time | : 6 Months |
| Remarks | : 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. |

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Aspiration toxicity

Not classified based on available information.

SECTION 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 Exposure time: 72 h Test substance: Water Accommodated Fraction Method: OECD Test Guideline 201 Remarks: Based on data from similar materials |

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|--|--|
| 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 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 |

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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

Corundum:

Ecotoxicology Assessment

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

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

Mobility in soil

No data available

Other adverse effects

No data available

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods

Waste from residues : Dispose of in accordance with local regulations.
Do not dispose of waste into sewer.

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.

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SECTION 14. TRANSPORT INFORMATION

International Regulations

UNRTDG

Not regulated as a dangerous good

IATA-DGR

Not regulated as a dangerous good

IMDG-Code

Not regulated as a dangerous good

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

Not applicable for product as supplied.

Domestic regulation

49 CFR

Not regulated as a dangerous good

Special precautions for user

Not applicable

SECTION 15. REGULATORY INFORMATION

CERCLA Reportable Quantity

This material does not contain any components with a CERCLA RQ.

SARA 304 Extremely Hazardous Substances Reportable Quantity

This material does not contain any components with a section 304 EHS RQ.

SARA 302 Extremely Hazardous Substances Threshold Planning Quantity

This material does not contain any components with a section 302 EHS TPQ.

SARA 311/312 Hazards : No SARA Hazards

SARA 313 : This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

US State Regulations

Pennsylvania Right To Know

| | |
|----------------------------|------------|
| Zircon | 14940-68-2 |
| Sillimanite | 12141-45-6 |
| Kyanite | 1302-76-7 |
| Rutile (TiO ₂) | 1317-80-2 |
| Staurolite | 12182-56-8 |
| Quartz | 14808-60-7 |

California Prop. 65

WARNING: This product can expose you to chemicals including Quartz, which is/are known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov.

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California List of Hazardous Substances

| | |
|----------|------------|
| Zircon | 14940-68-2 |
| Corundum | 1302-74-5 |

California Permissible Exposure Limits for Chemical Contaminants

| | |
|----------|------------|
| Zircon | 14940-68-2 |
| Corundum | 1302-74-5 |
| Quartz | 14808-60-7 |

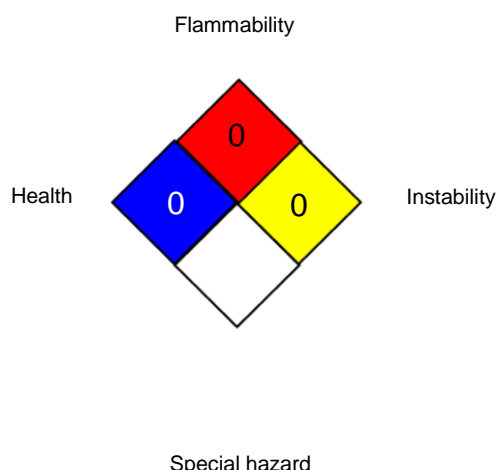
California Regulated Carcinogens

| | |
|--------|------------|
| Quartz | 14808-60-7 |
|--------|------------|

SECTION 16. OTHER INFORMATION

Further information

NFPA 704:



HMIS® IV:

| | | |
|-----------------|---|---|
| HEALTH | / | 0 |
| FLAMMABILITY | | 0 |
| PHYSICAL HAZARD | | 0 |

HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. The "*" represents a chronic hazard, while the "/" represents the absence of a chronic hazard.

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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 ra-

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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 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.

Full text of other abbreviations

| | | |
|-----------------|---|---|
| ACGIH | : | USA. ACGIH Threshold Limit Values (TLV) |
| NIOSH REL | : | USA. NIOSH Recommended Exposure Limits |
| OSHA CARC | : | OSHA Specifically Regulated Chemicals/Carcinogens |
| OSHA Z-1 | : | USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants |
| OSHA Z-3 | : | USA. Occupational Exposure Limits (OSHA) - Table Z-3 Mineral Dusts |
| ACGIH / TWA | : | 8-hour, time-weighted average |
| ACGIH / STEL | : | Short-term exposure limit |
| NIOSH REL / TWA | : | Time-weighted average concentration for up to a 10-hour workday during a 40-hour workweek |
| NIOSH REL / ST | : | STEL - 15-minute TWA exposure that should not be exceeded at any time during a workday |
| OSHA CARC / PEL | : | Permissible exposure limit (PEL) |
| OSHA Z-1 / TWA | : | 8-hour time weighted average |
| OSHA Z-3 / TWA | : | 8-hour time weighted average |

AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Hazardous Substance; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; 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; HMIS - Hazardous Materials Identification System; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC

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- 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; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; 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; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TECL - 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

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

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

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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