



Staurolite Products

Version 3.0

Revision Date 2012/04/17

Document no. 150000002242

This SDS adheres to the standards and regulatory requirements of China and may not meet the regulatory requirements in other countries.

Section 1 - Chemical and Enterprise Identification

Chinese name : Staurolite Products
Product name in English : Staurolite Products
Specifications : Staurolite Sands, Biasill[®] Staurolite Sand, Biasill[®] XL Staurolite Sand, Coarse Staurolite, Starblast[®] Blasting Abrasives, Starblast[®] Ultra Blasting Abrasives

Manufacturer or supplier's details

Company : Du Pont China Holding Co., Ltd
Street address : China, Shanghai, 399 KeYuan Road, Bldg 11, Zhangjiang Hi-Tech Park, Pudong New District 201203

Telephone : 86 21 3862 2888
Telefax : 86 21 3862 2889

Emergency telephone number : 86 532 8388 9090

Recommended use of the chemical and restriction on use

Recommended use : Abrasive blasting, Sand blasting

Section 2 - Hazard Identification

GHS Hazard Category

Carcinogenicity	Category 1A
Specific target organ toxicity - repeated exposure	Category 1

GHS Label Elements

Pictogram :



Signal word : Danger

Hazardous warnings : May cause cancer.
 Causes damage to organs through prolonged or repeated exposure.



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Hazardous prevention measures : Obtain special instructions before use.
 Do not handle until all safety precautions have been read and understood.
 Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
 Wash skin thoroughly after handling.
 Do not eat, drink or smoke when using this product.
 Use personal protective equipment as required.
 IF exposed or concerned: Get medical advice/ attention.
 Dispose of contents/ container to an approved waste disposal plant.

Other hazards which do not result in classification or are not covered by the GHS

The product, as shipped, poses a minimal inhalation health hazard because the bulk of the particles are in the non-inhalable size range. However, if during handling or use the particles are broken down to a size that can be inhaled, the dusts may be harmful to the respiratory system.

Product dust may be irritating to eyes, skin and respiratory system.

Main Symptom and Emergency Summary After Contact

Refer to section 4 of this SDS for information on symptoms, hazards and treatment after contact.

Section 3 - Ingredients/Composition Information

Chemical nature : Mixture

Components

Chemical Name	CAS-No.	Concentration
Staurolite	12182-56-8	85 - 90%
Iron titanate	12022-71-8	<=10%
Quartz	14808-60-7	1 - 5%
Rutile (TiO ₂)	1317-80-2	<=5%
Zircon	14940-68-2	<=3%
Kyanite	1302-76-7	<=2%

Section 4 - First-aid Measures

Inhalation : Remove person to fresh air. If signs/symptoms continue, get medical attention.

Skin contact : Wash off with soap and water.

Eye contact : Rinse with plenty of water.

Ingestion : No specific intervention is indicated. Consult a physician if necessary.

Most important symptoms/effects, acute and delayed : irritant effects

Protection of first-aiders : No information available.

Notes to physician : No specific intervention is indicated. No special protective equipment required.



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Section 5 - Fire-fighting Measures

Suitable extinguishing media : Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Specific hazards : Not a fire or explosion hazard.

Specific fire fighting methods and special protective equipment for fire fighters : No special protective equipment required. The product itself does not burn.

Section 6 - Leak Emergency Treatment

Protective measures, devices and emergency treatment procedure for workers : Avoid breathing dust.

Environmental protection measures : Do not flush into surface water or sanitary sewer system.

Collection of leaking materials, removal method and materials used for disposal : Pick up and arrange disposal without creating dust. After cleaning, flush away traces with water.

Prevention of secondary hazards : No information available.

Section 7 - Operation Handling and Storage

Operation Handling

Technical measures/Precautions : Avoid formation of additional inhalable particles. If handling inhalable particulates, use of gloves and washing before eating, drinking, applying cosmetics or smoking is advisable to minimize dust inhalation or ingestion of residue from hands.

Precautions for safe handling : This is a fully oxidized mineral product. As such it cannot support combustion or participate in a dust explosion.

Hygiene measures : Avoid breathing dust. Wash hands before breaks and at the end of workday.

Storage

Suitable storage conditions : Keep container tightly closed in a dry and well-ventilated place.



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Section 8 - Exposure Control and Personal Protection

Engineering controls : Use sufficient ventilation to keep employee exposure below recommended limits. If using this product as an abrasive blast agent in confined areas, airborne dust levels should be controlled by physical enclosure of the abrasive blasting operation. The enclosure should be exhaust ventilated.

Occupational Exposure Limits

Chemical Name	Occupational Exposure Limits		Regulation
Quartz	TWA	0.025 mg/m ³ (Respirable fraction.)	US. ACGIH Threshold Limit Values
	TWA	0.5 mg/m ³ (Total dust.)	Occupational Exposure Limit for Hazardous Agents in the Workplace
	TWA	0.2 mg/m ³ (Respirable dust.)	Occupational Exposure Limit for Hazardous Agents in the Workplace
Rutile (TiO ₂)	AEL *	10 mg/m ³ (Total dust.)	US. ACGIH Threshold Limit Values
Zircon (as Zr)	TWA	5 mg/m ³	Occupational Exposure Limit for Hazardous Agents in the Workplace
(as Zr)	STEL	10 mg/m ³	Occupational Exposure Limit for Hazardous Agents in the Workplace
(as Zr)	TWA	5 mg/m ³	US. ACGIH Threshold Limit Values
(as Zr)	STEL	10 mg/m ³	US. ACGIH Threshold Limit Values

Biological occupational exposure limits : No information available.

Personal protective equipment

Respiratory protection : A certified air-purifying respirator with a type 100 (high efficiency) particulate cartridge or canister may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits. Use a certified positive pressure air-supplied respirator in circumstances where air-purifying respirators may not provide adequate protection. For abrasive blasting use an abrasive-blast supplied-air respirator (the respirator air line must be separate from the line that supplies air for blasting) covering head, neck, and shoulders to provide protection from rebound abrasive. Evaluations as to which personnel may require respiratory protection should include consideration of potential exposure to bystanders near dust generating activities such as, for example, abrasive blasting.

Hand protection : Gloves

Eye protection : Wear safety glasses with side shields.

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Skin protection : Where there is potential for skin contact have available and wear as appropriate impervious gloves, apron, pants, and jacket.

Section 9 - Physical and Chemical Properties**Appearance (Physical state, form, colour, etc.)**

Physical state : solid
Form : Solid form, crystalline
Colour : red brown

Odour : odourless

Odour Threshold : not applicable

pH (specified concentration) : not applicable

Melting point/freezing point

Melting point : 1,370 °C

Boiling point, initial boiling point and boiling range

no data available

Flammability (solid, gas) : The product is not flammable.

Flash point : does not flash

Decomposition temperature : not applicable

Autoignition temperature : not applicable

Explosion limits

Upper explosion limit : not applicable

Lower explosion limit : not applicable

Vapour pressure : not applicable

Vapour density : not applicable

Density

Relative density : 3.7

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Solubility(ies)

Water solubility : insoluble

Solubility in other solvents : not applicable

Partition coefficient: n-octanol/water : not applicable**Evaporation rate** : not applicable**Section 10 - Stability and Reactivity**

Stability : No information available.

Possible hazardous reactions under specific conditions : None.

Conditions to avoid : not applicable

Materials to avoid : None.

Hazardous decomposition products : not applicable

Section 11 - Toxicological Information

Acute toxicity : Quartz:

Oral: ALD/rat : > 11,000 mg/kg

Inhalation: human :

Effects of breathing high concentration of respirable particles may include:
Breathing difficulties Cough Adverse body weight effects Lung damageRutile (TiO₂):

Oral: LD50/rat : > 5,000 mg/kg

Inhalation: LC50/4 h/rat : > 6.82 mg/l

Skin corrosion/irritation : Quartz:

Species: animals (unspecified species)
Classification: Not classified as irritant
Result: No skin irritationRutile (TiO₂):

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Species: rabbit
Classification: Not classified as irritant
Result: No skin irritation

Eye irritation/corrosion

: Quartz:

Species: animals (unspecified species)
Classification: Not classified as irritant
Result: slight irritation

Rutile (TiO₂):

Species: rabbit
Classification: Not classified as irritant
Result: No eye irritation

Respiratory or skin sensitization

: Quartz:

Species: animals (unspecified species)
Classification: Not a skin sensitizer.
Result: Did not cause sensitization on laboratory animals.

Rutile (TiO₂):

Local lymph node test
Species: mouse
Result: Did not cause sensitization on laboratory animals.

Buehler Test
Species: guinea pig
Result: Did not cause sensitization on laboratory animals.

Germ cell mutagenicity

: Quartz:

Did not cause genetic damage in cultured bacterial cells. Did not cause genetic damage in animals. Genetic damage in cultured mammalian cells was observed in some laboratory tests but not in others.

Rutile (TiO₂):

Did not cause genetic damage in animals. Tests on bacterial or mammalian cell cultures did not show mutagenic effects.

Carcinogenicity

: Quartz:

An increased incidence of tumours was observed in laboratory animals. An increased risk of cancer in humans has been shown in workplace-based studies.

Rutile (TiO₂):

In lifetime inhalation studies rats were exposed for 2 years to respectively 10, 50



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and 250 mg/m³ of respirable TiO₂. Slight lung fibrosis was observed at 50 and 250 mg/m³ levels. Microscopic lung tumours were also observed in 13 percent of the rats exposed to 250 mg/m³, an exposure level that caused lung overloading and impairment of rat lungs clearance mechanisms. In further studies, these tumours were found to occur only under particle overload conditions in a uniquely sensitive species, the rat, and have little or no relevance for humans. The pulmonary inflammatory response to TiO₂ particles exposure was also found to be much more severe in rats than in other rodent species. In February 2006, IARC has re-evaluated Titanium dioxide as pertaining to Group 2B: "possibly carcinogenic to humans", based upon inadequate evidence in humans and sufficient evidence in experimental animals for the carcinogenicity of titanium dioxide. IARC evaluation guidelines consider the generation of tumours, in 2 different studies within the same animal species, to be adequate criteria for an assessment of sufficient evidence. The conclusions of several epidemiology studies on more than 20000 TiO₂ industry workers in Europe and the USA did not suggest a carcinogenic effect of TiO₂ dust on the human lung. Mortality from other chronic diseases, including other respiratory diseases, was also not associated with exposure to TiO₂ dust. Based upon all available study results, DuPont scientists conclude that titanium dioxide will not cause lung cancer or chronic respiratory diseases in humans at concentrations experienced in the workplace.

- Toxicity for reproduction : Quartz:
No adverse effects expected.
- Specific Target Organs : Refer to acute toxicity and/or repeated dose toxicity data for more information
Toxicity (Single/Repeated) on target organs if applicable.
- Aspiration hazard : not applicable
- Other : Quartz:
Repeated dose toxicity: Inhalation
Fluid retention in lungs (pulmonary oedema), lung effects, Inflammation,
Chronic lung disease, Fibrosis
Rutile (TiO₂):
The toxicological data has been taken from products of similar composition.
Repeated dose toxicity: Oral, rat
No toxicologically significant effects were found.
Repeated dose toxicity: Inhalation, rat
No toxicologically significant effects were found.

Section 12 - Ecological Information

Ecotoxicity effects

- Toxicity to fish : Rutile (TiO₂):
LC50/96 h/Pimephales promelas (fathead minnow): > 1,000 mg/l

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Other	:	Rutile (TiO ₂): EC50/72 h/Pseudokirchneriella subcapitata (green algae): 61 mg/l EC50/48 h/Daphnia magna (Water flea): > 1,000 mg/l
Persistence and degradation	:	Staurolite Products: Not inherently biodegradable.
Bioaccumulation	:	Staurolite Products: Does not bioaccumulate.
Mobility in soil	:	no data available
Other adverse effects	:	Staurolite Products: not applicable

Section 13 - Waste Disposal

Waste disposal methods : Dispose of in accordance with local regulations.

Section 14 - Transport Information

Not classified as dangerous in the meaning of transport regulations.

Section 15 - Regulatory Information

Regulations on the Control over the Safety of Dangerous Chemicals
Production Safety Law of the People's Republic of China
Law of the People's Republic of China on Prevention and Treatment of Occupational Disease
Environmental Protection Law of the People's Republic of China
Law of the People's Republic of China on the Prevention and Control of Atmospheric Pollution
Marine Environment Protection Law of the People's Republic of China
Fire Protection Law of the People's Republic of China
Law of the People's Republic of China on the Prevention and Control of Environmental Pollution by Solid Wastes
Occupational exposure limits for hazardous agents in the workplace Part 1 Chemical hazardous agents (GBZ2.1)
Occupational exposure limits for hazardous agents in the workplace Part 2 Physical agents (GBZ2.2)
General rule for classification and hazard communication of chemicals (GB13690)
National Hazardous Waste Inventory



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Section 16 - Other Information

References : US MSDS No.: 3004CR

Other information : Staurolite Products contain trace quantities of naturally occurring radioactive uranium and thorium (less than or equal to 25 ppm uranium plus 175 ppm thorium = 200 ppm total U + Th or 0.02 % w/w, equivalent to 28 pCi/g or less), and radium (less than or equal to 28 pCi/g). Naturally Occurring Radioactive Material, namely uranium, thorium, and their decay products, including radium, is commonly referred to as "NORM".

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 μ m, the calculated reference dust level is 6.9 mg/m³. For a total dust with aerodynamic diameter of 5 μ m, the calculated reference dust level is 10.8 mg/m³. For a total dust with aerodynamic diameter of 10 μ m, the calculated reference dust level is 15.9 mg/m³.

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.

Please see www2.dupont.com/Titanium_Technologies/en_US/ for the latest version of this MSDS.

Do not use DuPont materials in medical applications involving implantation in the human body or contact with internal body fluids or tissues unless the material has been provided from DuPont under a written contract that is consistent with DuPont policy regarding medical applications and expressly acknowledges the contemplated use. For further information, please contact your DuPont representative. You may also request a copy of the DuPont POLICY Regarding Medical Applications H-50103-3 and DuPont CAUTION Regarding Medical Applications H-50102-3.

These products may not be directly added to food or pharmaceuticals and are not recommended for use in medical devices or cosmetics.



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Significant change from previous version is denoted with a double bar.

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 given is designed only as a guide for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The above information relates only to the specific material(s) designated herein and may not be valid for such material(s) used in combination with any other materials or in any process or if the material is altered or processed, unless specified in the text.