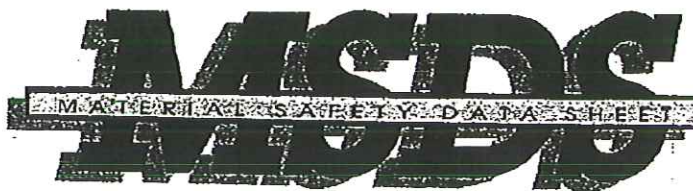




DuPont Chemicals

3004CR



Revised 12-FEB-2004

Printed 19-FEB-2004

## STAUROLITE PRODUCTS

### CHEMICAL PRODUCT/COMPANY IDENTIFICATION

**Material Identification**

Corporate MSDS Number DU002808

Grade See Component Section

**Tradenames and Synonyms**

STAUROLITE SANDS  
BIASILL  
BIASILL XL  
COARSE STAUROLITE  
STARBLAST / STARBRITE  
STARBLAST XL  
STARBLAST ULTRA

**Company Identification****MANUFACTURER/DISTRIBUTOR**

DuPont Titanium Technologies  
1007 Market Street  
Wilmington, DE 19898

**PHONE NUMBERS**

Product Information 1-800-441-9485 (outside the U.S.  
302-774-1000)  
Transport Emergency CHEMTREC 1-800-424-9300 (outside U.S.  
703-527-3887)  
Medical Emergency 1-800-441-3637 (outside the U.S.  
302-774-1000)

### COMPOSITION/INFORMATION ON INGREDIENTS

**# Components****Material****CAS Number****%**

"BIASILL":

STAUROLITE

12182-56-8

86

TITANIUM MINERALS

6

(Continued)

**COMPOSITION/INFORMATION ON INGREDIENTS**(Continued)

QUARTZ	14808-60-7	<5
ZIRCON	14940-68-2	3
KYANITE	1302-76-7	2
"BIASILL XL":		
STAUROLITE	12182-56-8	88
TITANIUM MINERALS		6
QUARTZ	14808-60-7	<1
ZIRCON	14940-68-2	3
KYANITE	1302-76-7	2
COARSE STAUROLITE:		
STAUROLITE	12182-56-8	85
TITANIUM MINERALS		10
QUARTZ	14808-60-7	<5
"STARBLAST" / "STARBRITE"		
STAUROLITE	12182-56-8	86
TITANIUM MINERALS		6
QUARTZ	14808-60-7	<5
ZIRCON	14940-68-2	3
KYANITE	1302-76-7	2
"STARBLAST" XL:		
STAUROLITE	12182-56-8	90
TITANIUM MINERALS		6
ZIRCON	14940-68-2	2
KYANITE	1302-76-7	1
QUARTZ	14808-60-7	<1
"STARBLAST" ULTRA		
STAUROLITE	12182-56-8	85
TITANIUM MINERALS		7
QUARTZ	14808-60-7	<5
ZIRCON	14940-68-2	3
KYANITE	1302-76-7	2

(Continued)



## HAZARDS IDENTIFICATION

### Potential Health Effects

Eye contact with the product may cause irritation with discomfort, tearing, or blurring of vision.

The product, as shipped, does not pose an inhalation health hazard because it contains essentially no particles in the respirable 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. Individuals with preexisting conditions of the lungs may have increased susceptibility to the toxicity of excessive exposures.

Staurolite Products contain trace quantities (<5%) of quartz. The predominant effect of overexposure to airborne respirable quartz in humans is silicosis. Silicosis is a chronic disease characterized by formation of silica-containing scar tissue in the lungs with symptoms of coughing, dyspnea, wheezing and nonspecific respiratory ailments. Very high short exposures to Crystalline Silica may lead to fatality from gross overexposure.

Several recent epidemiology studies have shown that in addition to silicosis, there is limited evidence of an excess of lung cancer in occupations involving exposures mainly to Crystalline Silica, such as stone cutters and granite industry workers.

Staurolite Products contain trace quantities (less than or equal to 28 pCi/g) of naturally occurring radioactive uranium and thorium (less than or equal to 200 ppm total uranium and thorium or 0.02 % w/w), and (less than or equal to 28 pCi/g) radium. Naturally Occurring Radioactive Material, namely uranium, thorium, and their decay products, 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 zircon may present a lesser, external exposure that can be managed by limiting close proximity for long time periods to large volumes of material.

Staurolite is exempt from Nuclear Regulatory Commission (NRC) regulations for source material per 10 CFR 40, since it falls under the definition of "unimportant quantity source material" containing less than 0.05% uranium or thorium. Some states may apply NRC type radiation protection

(Continued)

---

**HAZARDS IDENTIFICATION** (Continued)

---

standards for NORM above background levels, or may have NORM specific regulations. It is recommended that you consult and comply with current regulations.

With respect to dust exposure (8 hr/day TWA basis, 10 um aerodynamic, or about 5 um physical diameter particle size used for calculation purposes), evaluation and calculation of OSHA PEL's (29 CFR 1910), ACGIH TLV's, and NRC standards (10 CFR 20) for trace crystalline silica, and trace radionuclides indicate that a level of approximately 4.3 mg/m<sup>3</sup> of total dust (or 1.0 mg/m<sup>3</sup> of respirable dust) will ensure that intake is less than the NRC public dose limit for radionuclides, and less than OSHA and ACGIH limits for respirable and total quartz. Quartz is the most limiting of the trace components. If during handling or use the particles are broken down to finer particle sizes, lower levels of total dust would apply.

---

**Carcinogenicity Information**

The following components are listed by IARC, NTP, OSHA or ACGIH as carcinogens.

**Material****IARC NTP OSHA ACGIH****QUARTZ**

1

X

A2

DuPont controls the following materials as carcinogens:  
QUARTZ.

---

**FIRST AID MEASURES**

---

**First Aid****INHALATION**

If inhaled, immediately remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

**SKIN CONTACT**

The compound is not hazardous by skin contact, but removal of particles and cleansing the skin after use is advisable.

**EYE CONTACT**

In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Call a physician.

**INGESTION**

No specific intervention is indicated as the compound is not hazardous by ingestion. However, if symptoms occur, consult a physician.

---

(Continued)



---

**FIRE FIGHTING MEASURES**

---

**Flammable Properties**  
Will not burn.

**Extinguishing Media**  
As appropriate for combustibles in area.

**Fire Fighting Instructions**  
None.

---

**ACCIDENTAL RELEASE MEASURES**

---

**Safeguards (Personnel)**

NOTE: Review FIRE FIGHTING MEASURES and HANDLING (PERSONNEL) sections before proceeding with clean-up. Use appropriate PERSONAL PROTECTIVE EQUIPMENT during clean-up.

**Accidental Release Measures**  
Sweep up spillage.

---

**HANDLING AND STORAGE**

---

**Handling (Personnel)**

Avoid breathing dust. Wash thoroughly after handling.

If handling respirable flour, use of gloves and washing before eating, drinking, applying cosmetics or smoking is advisable to minimize dust inhalation or ingestion from hands.

---

**EXPOSURE CONTROLS/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 in accordance with 29 CFR 1910.94 Ventilation (a) Abrasive blasting.

**Personal Protective Equipment**  
**EYE/FACE PROTECTION**

Wear safety glasses with side shields.

**RESPIRATORS**

A NIOSH approved air-purifying respirator with a type 100 (high efficiency) particulate cartridge or canister may be permissible under certain circumstances where airborne

(Continued)

## EXPOSURE CONTROLS/PERSONAL PROTECTION(Continued)

concentrations are expected to exceed exposure limits. Protection provided by air-purifying respirators is limited. Use a NIOSH approved positive pressure air-supplied respirator if there is any potential for an uncontrolled release, exposure levels are not known, or any other circumstances where air-purifying respirators may not provide adequate protection.

For abrasive blasting use a type CE abrasive-blast supplied-air respirator covering head, neck, and shoulders to provide protection from rebound abrasive per 29 CFR 1910.94 (a)(5).

### PROTECTIVE CLOTHING

Wear impervious clothing, such as gloves, apron, boots or whole bodysuit, as appropriate.

### Exposure Guidelines

#### Applicable Exposure Limits

##### QUARTZ

PEL (OSHA)

Total dust, (30 mg/m<sup>3</sup> / % SiO<sub>2</sub> + 2)  
Respirable dust, (10 mg/m<sup>3</sup> / % SiO<sub>2</sub> + 2)  
as 8 Hr TWA's

TLV (ACGIH)

0.05 mg/m<sup>3</sup>, respirable dust, 8 Hr. TWA, A2

Or see: Christobalite [14464-46-1],  
Silica, Fused [60676-86-0], Tridymite  
[15468-32-2], Tripoli [1317-95-9]  
0.1 mg/m<sup>3</sup>, 8 Hr. TWA, respirable dust

AEL \* (DuPont)

##### ZIRCON

PEL (OSHA)

TLV (ACGIH)

5 mg/m<sup>3</sup>, 8 Hr. TWA, as Zr  
5 mg/m<sup>3</sup>, 8 Hr. TWA, as Zr, A4  
STEL 10 mg/m<sup>3</sup>, as Zr, A4  
None Established

AEL \* (DuPont)

\* AEL is DuPont's Acceptable Exposure Limit. Where governmentally imposed occupational exposure limits which are lower than the AEL are in effect, such limits shall take precedence.

## PHYSICAL AND CHEMICAL PROPERTIES

### Physical Data

Vapor Pressure	Not volatile
Vapor Density	Not volatile
Melting Point	1,370 C (2,500 F)
Evaporation Rate	(Butyl Acetate = 1)
Solubility in Water	Not volatile
Odor	Insoluble
Form	Odorless
Color	Solid, free-flowing sand
Specific Gravity	Reddish brown
	3.7

(Continued)



---

## STABILITY AND REACTIVITY

**Chemical Stability**  
Stable.

**Incompatibility with Other Materials**  
None reasonably foreseeable.

**Decomposition**  
Decomposition will not occur.

**Polymerization**  
Polymerization will not occur.

---

## TOXICOLOGICAL INFORMATION

### Animal Data

#### Quartz:

Oral ALD: > 11,000 mg/kg in male rats

Quartz is not a skin irritant or a skin sensitizer in animals, but is a mild eye irritant. Single doses of 50 mg Quartz administered by intratracheal instillation have resulted in pulmonary fibrosis at 60 and 120 days post exposure in rats. Repeated and chronic exposures as low as 0.7 mg instillation and 12 mg/m<sup>3</sup> by inhalation resulted in pulmonary fibrosis, inflammation, edema and emphysema in animals exposed to Quartz. Lung tumors were observed in rats exposed for up to two years by inhalation to 12.4 or 51.6 mg/m<sup>3</sup> Quartz. Lung tumors were also observed in rats exposed to Quartz by intratracheal instillation. Silica was positive in mammalian cell cultures for cell transformation and chromosomal effects. It was negative in cell culture assays for gene mutation in bacteria and DNA damage in mammalian cells and in a whole animal assay for chromosomal effects. No animal test reports are available to define developmental, or reproductive toxicity.

---

## DISPOSAL CONSIDERATIONS

### Waste Disposal

Treatment, storage, transportation, and disposal must be in accordance with applicable Federal, State/Provincial, and Local regulations.

If approved, may be transferred to a land disposal site.

#### NOTE:

Some states have, or are developing, new regulations for disposal of waste containing Naturally Occurring Radioactive Materials (NORM) above background levels. It is recommended that you consult and comply with current regulations.

(Continued)

---

**TRANSPORTATION INFORMATION**

---

**Shipping Information**

Shipping Containers

Hopper Cars

Hopper Trucks

Bags

Semi-bulk Bags

STAUROLITE PRODUCTS ARE NOT REGULATED AS A HAZARDOUS MATERIAL BY DOT OR IMO.

---

**REGULATORY INFORMATION**

---

**U.S. Federal Regulations**

TSCA Inventory Status

Reported/Included.

TITLE III HAZARD CLASSIFICATIONS SECTIONS 311, 312

Acute : No  
Chronic : Yes  
Fire : No  
Reactivity : No  
Pressure : No

**LISTS:**

SARA Extremely Hazardous Substance -No  
CERCLA Hazardous Material -No  
SARA Toxic Chemical -No

Staurolite is exempt from Nuclear Regulatory Commission (NRC) regulations for source material per 10 CFR 40, since it falls under the definition of "unimportant quantity source material" containing less than 0.05% uranium or thorium.

**CANADIAN WHMIS CLASSIFICATION:**D-2A

---

**OTHER INFORMATION**

---

**NFPA, NPCA-HMIS**

NPCA-HMIS Rating

Health

1

Health

x (Chronic Health Effects)

Flammability

0

Reactivity

0

Personal Protection rating to be supplied by user depending on use conditions.

---

(Continued)



---

**OTHER INFORMATION**(Continued)

---

**Additional Information**

For further information, see DuPont Staurolite Sands Data Sheet.

Please see [www.titanium.dupont.com](http://www.titanium.dupont.com) for the latest version of this MSDS.

**WARNING!**

This product contains quartz and radionuclides which is known to the state of California to cause cancer.

---

The data in this Material Safety Data Sheet relates only to the specific material designated herein and does not relate to use in combination with any other material or in any process.

Responsibility for MSDS : MSDS Coordinator  
> : DuPont Titanium Technologies  
Address : Wilmington, DE 19898  
Telephone : (800) 441-9485

# Indicates updated section.

---

End of MSDS