



The MSDS format adheres to the standards and regulatory requirements of the United States and may not meet regulatory requirements in other countries.

DuPont  
Material Safety Data Sheet

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3004CR STAUROLITE PRODUCTS  
Revised 4-MAR-2008

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  
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
IRON TITANATE	12022-71-8	5
QUARTZ	14808-60-7	<5
ZIRCON	14940-68-2	3
KYANITE	1302-76-7	2
RUTILE	1317-80-2	1
"BIASILL XL"*:		
STAUROLITE	12182-56-8	88
IRON TITANATE	12022-71-8	5
QUARTZ	14808-60-7	<1
ZIRCON	14940-68-2	3

## (COMPOSITION/INFORMATION ON INGREDIENTS - Continued)

KYANITE	1302-76-7	2
RUTILE	1317-80-2	1
COARSE STAUROLITE*:		
STAUROLITE	12182-56-8	85
IRON TITANATE	12022-71-8	9
QUARTZ	14808-60-7	<5
RUTILE	1317-80-2	1
"STARBLAST"*:		
STAUROLITE	12182-56-8	86
IRON TITANATE	12022-71-8	5
QUARTZ	14808-60-7	<5
ZIRCON	14940-68-2	3
KYANITE	1302-76-7	2
RUTILE	1317-80-2	1
"STARBLAST" ULTRA*:		
STAUROLITE	12182-56-8	85
IRON TITANATE	12022-71-8	3
QUARTZ	14808-60-7	<5
ZIRCON	14940-68-2	3
KYANITE	1302-76-7	2
RUTILE	1317-80-2	4

## Components (Remarks)

\*Separate Products

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HAZARDS IDENTIFICATION  
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## # Potential Health Effects

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

The product, as shipped, poses a minimal 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 low 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

(HAZARDS IDENTIFICATION - Continued)

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 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 Staurolite or Biasill 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 standards for NORM above background levels, or may have NORM specific regulations that are determined based upon the radium content. It is recommended that you consult with current regulations.

With respect to dust exposure for standard grade products, evaluation and calculation of OSHA PEL's (29 CFR 1910), ACGIH TLV's, and dosimetry (ICRP 68) yield the following guidance to ensure that inhalation intake is less than OSHA and ACGIH limits for zircon, less than OSHA and ACGIH limits for respirable and total quartz, and less than the NRC public dose limit (10 CFR 20) for radionuclides:

Dust Level	Dust Type	Aero Diam	Limiting Component
- - - - -	- - - - -	- - - - -	- - - - -
0.5 mg/m3	Respirable	-	Quartz
4.3 mg/m3	Total	-	Quartz

(HAZARDS IDENTIFICATION - Continued)

For XL grade Biasill, the corresponding levels are:

Dust Level	Dust Type	Aero Diam	Limiting Component
2.5 mg/m3	Respirable	-	Quartz
6.9 mg/m3	Total	1 um	NORM
10.0 mg/m3	Total	>5 um	Quartz

The calculations noted above are based upon 8 hr/day TWAs. It should be noted that for staurolites, the actual particle physical diameter is approximately 1/2 the effective aerodynamic diameter. For Biasill XL, as shipped, with essentially no particles as small as calculated above, quartz is the most limiting of the components. However, if during handling or use the particles are broken down to finer particle sizes, the lower NORM total dust references 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.

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FIRST AID MEASURES  
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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.

(FIRST AID MEASURES - Continued)

INGESTION

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

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FIRE FIGHTING MEASURES  
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Flammable Properties

Will not burn.

Extinguishing Media

As appropriate for combustibles in area.

Fire Fighting Instructions

None.

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ACCIDENTAL RELEASE MEASURES  
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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.

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HANDLING AND STORAGE  
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Handling (Personnel)

Avoid breathing dust. Wash thoroughly after handling.

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

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EXPOSURE CONTROLS/PERSONAL PROTECTION  
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## 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 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).

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.

## 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)	: 0.025 mg/m <sup>3</sup> , respirable dust, 8 Hr. TWA, A2
AEL * (DuPont)	: 0.1 mg/m <sup>3</sup> , 8 Hr. TWA, respirable dust 0.05 mg/m <sup>3</sup> , 12 Hr. TWA, respirable dust

## ZIRCON

PEL (OSHA)	: 5 mg/m <sup>3</sup> , 8 Hr. TWA, as Zr
TLV (ACGIH)	: 5 mg/m <sup>3</sup> , 8 Hr. TWA, as Zr, A4 STEL 10 mg/m <sup>3</sup> , as Zr, A4
AEL * (DuPont)	: None Established

\* 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.

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PHYSICAL AND CHEMICAL PROPERTIES  
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## Physical Data

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

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STABILITY AND REACTIVITY  
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## Chemical Stability

Stable.

## Incompatibility with Other Materials

None reasonably foreseeable.

## Decomposition

Decomposition will not occur.

## Polymerization

Polymerization will not occur.

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TOXICOLOGICAL INFORMATION  
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## 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.

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DISPOSAL CONSIDERATIONS  
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## 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 with current regulations.

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TRANSPORTATION INFORMATION  
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## Shipping Information

## Shipping Containers

Hopper Cars  
Hopper Trucks  
Bags  
Semi-bulk Bags



## (TRANSPORTATION INFORMATION - Continued)

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

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REGULATORY INFORMATION  
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## 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 CRF 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

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OTHER INFORMATION  
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## 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)

## Additional Information

## WARNING!

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

MEDICAL USE: CAUTION: Do not use in medical applications involving permanent implantation in the human body. For other medical applications, see DuPont CAUTION Bulletin No. H-50102.

The required testing has not been done to qualify any of our grades for direct inclusion in food, drugs, or cosmetic formulations.

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.

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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.

This information is based upon technical information believed to be reliable. It is subject to revision as additional knowledge and experience is gained.

End of MSDS