

# MATERIAL SAFETY DATA SHEET

MSDS No: DF102

Date Prepared: 09/25/1996

Current Date: 5/26/2009

Last Revised: (11/20/2002)

## 1. PRODUCT AND COMPANY IDENTIFICATION

**Product Group:** CRUCIBLES, DENTALS  
**Chemical Name:** Aluminosilicate Product  
**Intended Use:** To Contain Molten Metal / Alloys  
**Trade Names:** DFC FS #44 Dertal; DFC FS Dental: White & Blue; DFC SIC #44 Dental

**Manufacturer/Supplier:** KEYSTONE INDUSTRIES  
616 Hollywood Ave  
Cherry Hill, NJ 08002  
Telephone: 856-663-4700  
Emergencies: 800-535-5053

## 2. COMPOSITION/INFORMATION ON INGREDIENTS

<u>INGREDIENT &amp; CAS NUMBER</u>	<u>% BY WEIGHT</u>	<u>OSHA PEL</u>	<u>ACGIH TLV</u>
Silica, fused (amorphous) 60676-86-0	Up to 70	(80 mg/m <sup>3</sup> ÷ % SiO <sub>2</sub> ) or 20 mppcf	0.1 mg/m <sup>3</sup> (respirable dust)
Silica, amorphous 7631-86-9	30 - 80	(80 mg/m <sup>3</sup> ÷ % SiO <sub>2</sub> ) or 20 mppcf	10 mg/m <sup>3</sup>
Alumina 1344-28-1	5 - 15	15 mg/m <sup>3</sup> (total dust); 5 mg/m <sup>3</sup> (respirable dust)	10 mg/m <sup>3</sup>
Crystalline silica 14808-60-7 or 14464-46-1	1 - 11	See notes <sup>(1)</sup>	0.05 mg/m <sup>3</sup> (respirable dust)
Calcium oxide 1305-78-8	<2.0	5 mg/m <sup>3</sup>	2 mg/m <sup>3</sup>
Ferric oxide 1309-37-1	<1.0	10 mg/m <sup>3</sup>	5 mg/m <sup>3</sup>
Titanium dioxide 13463-67-7	<1.0	15 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>

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## NOTES:

- <sup>(1)</sup> Depending on the percentage and type(s) of silica in the mineral, the OSHA Permissible Exposure Limit (PEL) for respirable dust containing crystalline silica (8 HR TWA) is based on the formula listed in 29 CFR 1910.1000, "Air Contaminants" under Table Z-3, "Mineral Dust". For quartz containing mineral dust, the PEL = 10 mg/m<sup>3</sup> / (% of silica + 2); for cristobalite or tridymite, the PEL = 5 mg/m<sup>3</sup> / (% of silica + 2); for mixtures, the PEL = 10 mg/m<sup>3</sup> / (% of quartz + 2 (% of cristobalite) + 2 (% of tridymite) + 2).

(See Section 8 "Exposure Controls / Personal Protection" for exposure guidelines.)

## 3. HAZARDS IDENTIFICATION

### EMERGENCY OVERVIEW

#### WARNING!

These products are classified as articles by OSHA Standard 1910.1200, however, respirable dust from these products may aggravate existing chronic lung conditions such as bronchitis, emphysema and asthma.

### POSSIBLE HEALTH EFFECTS

**Target Organs:** Eyes, skin, nose and/or throat  
**Primary Entry Route:** Inhalation  
**Acute effects:** May cause temporary, mild mechanical irritation to the eyes, skin, nose and/or throat. Pre-existing skin and respiratory conditions may be aggravated by exposure.  
**Chronic effects:** Prolonged/repeated inhalation of respirable crystalline silica may cause delayed lung injury (e.g.: silicosis, lung cancer).

### HAZARD CLASSIFICATION

Dust samples from these products have not been tested for their specific toxicity, but may contain more than 0.1% crystalline silica, for which the following apply:

The **International Agency for Research on Cancer (IARC)** has classified crystalline silica inhaled in the form of quartz or cristobalite from occupational sources as carcinogenic to humans (Group 1).

The Ninth Annual Report on Carcinogens (2000), prepared by the **National Toxicology Program (NTP)**, classified silica, crystalline (respirable size), as a substance known to be a human carcinogen.

The **American Conference of Governmental Industrial Hygienists (ACGIH)** has classified crystalline silica (quartz) as "A2-Suspected Human Carcinogen."

The **State of California**, pursuant to Proposition 65, The Safe Drinking Water and Toxic Enforcement Act of 1986, has listed "silica, crystalline (airborne particles of respirable size)" as a chemical known to the State of California to cause cancer.

The **Canadian Workplace Hazardous Materials Information System (WHMIS)** – Crystalline silica [quartz and cristobalite] is classified as Class D2A - Materials Causing Other Toxic Effects.

The **Hazardous Materials Identification System (HMIS)** –

Health: 0\* Flammability: 0 Reactivity: 0 Personal Protection Index: X (Employer determined)

(\* denotes potential for chronic effects)

## 4. FIRST AID MEASURES

### EYE IRRITATION:

Flush with large amounts of water for at least 15 minutes. Do not rub eyes.

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## SKIN IRRITATION:

Wash affected area gently with soap and water. Skin cream or lotion after washing may be helpful.

## INGESTION:

Unlikely route of exposure.

## INHALATION:

Remove affected person to dust free location. See Section 8 for additional measures to reduce or eliminate exposure.

- If symptoms persist, seek medical attention. -

## 5. FIRE FIGHTING MEASURES

### NFPA CODES:

Flammability: 0, Health: 0, Reactivity: 0, Special: 0

NFPA Unusual Hazards:

None

Flash Point:

None

Extinguishing Media:

Use extinguishing media suitable for type of surrounding fire.

Explosion Hazards:

None

Hazardous Decomposition Products:

None

## 6. ACCIDENTAL RELEASE MEASURES

### SPILL/LEAK PROCEDURES:

Avoid creating airborne dust. Follow routine housekeeping procedures. Vacuum only with HEPA filtered equipment. If sweeping is necessary, use a dust suppressant and place material in closed containers. Do not use compressed air for clean-up. Personnel should wear gloves, goggles and approved respirator.

## 7. HANDLING AND STORAGE

### HANDLING

Limit the use of power tools unless in conjunction with local exhaust. Use hand tools whenever possible. Frequently clean the work area with HEPA filtered vacuum or wet sweeping to minimize the accumulation of debris. Do not use compressed air for clean-up.

### STORAGE

Store in original factory container in a dry area. Keep container closed when not in use.

### EMPTY CONTAINERS

Product packaging may contain residue. Do not reuse.

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

### Engineering Controls:

Use in the furnace/oven with exhaust system or in a well ventilated area.

### Respiratory Protection:

Over exposure to any of the chemicals listed in Section 2 is not anticipated. Consult an industrial hygienist for exposure assessment due to abnormal use of this product. If respirators are selected, use NIOSH/MSHA approved respirators, in compliance with OSHA Respiratory Protection Standard 29 CFR 1910.134 and 29 CFR 1926.103, for the particular hazard or airborne concentrations to be encountered in the work environment.

### Protective Clothing:

No specific equipment required with this product.

### Eye Protection:

Goggles/safety glasses with sideshields should be worn.

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## 9. PHYSICAL AND CHEMICAL PROPERTIES

ODOR AND APPEARANCE:	Pressed shape
CHEMICAL FAMILY:	Aluminosilicates
BOILING POINT:	Not applicable
WATER SOLUBILITY (%):	Not soluble in water
MELTING POINT:	2750°F
SPECIFIC GRAVITY:	1.5 - 2.5
VAPOR PRESSURE:	Not applicable
pH:	Not applicable
VAPOR DENSITY:	Not applicable
VOLATILE BY VOLUME (%):	Not applicable
MOLECULAR FORMULA:	Not Applicable

## 10. STABILITY AND REACTIVITY

HAZARDOUS POLYMERIZATION:	Will not occur
CHEMICAL INCOMPATIBILITIES:	Powerful oxidizers; fluorine, manganese trioxide, oxygen disulfide
HAZARDOUS DECOMPOSITION PRODUCTS:	None

## 11. TOXICOLOGICAL INFORMATION

### TOXICOLOGY

Dust samples from these products have not been tested. They may contain respirable crystalline silica.

#### Crystalline silica

Some samples of crystalline silica administered to rats by inhalation and intratracheal instillation have caused fibrosis and lung cancer. Mice and hamsters, similarly exposed, develop inflammatory disease including fibrosis but no lung cancer.

#### Silica, amorphous

Toxic effects described in animals from single inhalation exposures of amorphous silica include upper respiratory irritation, lung congestion, bronchitis, and emphysema. Repeated inhalation exposures at concentration of 50 or 150 mg/m<sup>3</sup> produced increased lung weights and lung changes. No progressive pulmonary fibrosis was seen and the observed lung changes were reversible. No adverse effects were observed in this study at 10 mg/m<sup>3</sup>. No animal test reports are available to define the carcinogenic, mutagenic, or reproductive effects.

### EPIDEMIOLOGY

No studies have been undertaken on humans exposed to these products in occupational environments.

#### Crystalline silica

Exposure to crystalline silica can cause silicosis, and exacerbate pulmonary tuberculosis and bronchitis. IARC (Monograph vol. 68, 1997) concluded that "crystalline silica from occupational sources inhaled in the form of quartz or cristobalite is carcinogenic to humans (Group 1)", and noted that "carcinogenicity in humans was not detected in all industrial circumstances studied" and "may be dependent on inherent characteristics of the crystalline silica or on external factors affecting its biological activity".

## 12. ECOLOGICAL INFORMATION

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Adverse effects of this material on the environment are not anticipated.

## 13. DISPOSAL INFORMATION

### WASTE MANAGEMENT

To prevent waste materials becoming airborne during waste storage, transportation and disposal, a covered container or plastic bagging is recommended. Comply with federal, state and local regulations.

### DISPOSAL

If discarded in its purchased form, this product would not be a hazardous waste under Federal regulations (40 CFR 261). Any processing, use, alteration or chemical additions to the product, as purchased, may alter the disposal requirements. Under Federal regulations, it is the waste generator's responsibility to properly characterize a waste material, to determine if it is a hazardous waste. Check local, regional, state or provincial regulations to identify all applicable disposal requirements.

## 14. TRANSPORT INFORMATION

### U.S. DEPARTMENT OF TRANSPORTATION (DOT)

Hazard Class:	Not Regulated	United Nations (UN) Number:	Not Applicable
Labels:	Not Applicable	North America (NA) Number:	Not Applicable
Placards:	Not Applicable	Bill of Lading:	Product Name

### INTERNATIONAL

Canadian TDG Hazard Class & PIN: Not regulated  
Not classified as dangerous goods under ADR (road), RID (train) or IMDG (ship).

## 15. REGULATORY INFORMATION

### UNITED STATES REGULATIONS

**SARA Title III:** This product does not contain any substances reportable under Sections 302, 304, 313 (40 CFR 372). Sections 311 and 312 apply.

**OSHA:** Comply with Hazard Communication Standards 29 CFR 1910.1200 and 29 CFR 1926.59 and Respiratory Protection Standards 29 CFR 1910.134 and 29 CFR 1926.103.

**TSCA:** All substances contained in this product are listed in the TSCA Chemical Inventory

**California:** "Silica, crystalline (airborne particles of respirable size)" is listed in Proposition 65, The Safe Drinking Water and Toxic Enforcement Act of 1986 as a chemical known to the State of California to cause cancer.

**Other States:** Crystalline silica products are not known to be regulated by states other than California; however, state and local OSHA and EPA regulations may apply to these products. Contact your local agency if in doubt.

### INTERNATIONAL REGULATIONS

**Canadian WHMIS:** Class D-2A Materials Causing Other Toxic Effects

**Canadian EPA:** All substances in this product are listed, as required, on the Domestic Substance List (DSL).

## 16. OTHER INFORMATION

### SARA TITLE III HAZARD CATEGORIES

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

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## DEFINITIONS:

ACGIH:	American Conference of Governmental Industrial Hygienists
ADR:	Carriage of Dangerous Goods by Road (International Regulation)
CAA:	Clean Air Act
CAS:	Chemical Abstracts Service Registry Number
CERCLA:	Comprehensive Environmental Response, Compensation and Liability Act
EPA:	Environmental Protection Agency
EU:	European Union
f/cc:	Fibers per cubic centimeter
HEPA:	High Efficiency Particulate Air
HMIS:	Hazardous Materials Identification System
IARC:	International Agency for Research on Cancer
IATA:	International Air Transport Association
IMDG:	International Maritime Dangerous Goods Code
mg/m <sup>3</sup> :	Milligrams per cubic meter of air
mppcf:	Million particles per cubic meter
MSHA:	Mine Safety and Health Administration
NFPA:	National Fire Protection Association
NIOSH:	National Institute for Occupational Safety and Health
OSHA:	Occupational Safety and Health Administration
PEL:	Permissible Exposure Limit
PNOC:	Particulates Not Otherwise Classified
PNOR:	Particulates Not Otherwise Regulated
RCRA:	Resource Conservation and Recovery Act
RID:	Carriage of Dangerous Goods by Rail (International Regulation)
SARA:	Superfund Amendments and Reauthorization Act
Title III:	Emergency Planning and Community Right to Know Act
...Section 302:	Extremely Hazardous Substances
...Section 304:	Emergency Release
...Section 311:	MSDS/List of Chemicals
...Section 312:	Emergency and Hazardous Inventory
...Section 313:	Toxic Chemicals Release Reporting
STEL:	Short-Term Exposure Limit
TCLP:	Toxicity Characteristics Leaching Procedures (EPA)
TLV:	Threshold Limit Values (ACGIH)
TSCA:	Toxic Substance Control Act
WHMIS:	Workplace Hazardous Materials Information System (Canada)
29 CFR 1910.134 & 1926.103:	OSHA Respiratory Protection Standards
29 CFR 1910.1200 & 1926.59:	OSHA Hazard Communication Standards

## Revision Summary:

MSDS revised in its entirety with updated information.

## MSDS Prepared By:

ENVIRONMENTAL, HEALTH & SAFETY DEPARTMENT

### DISCLAIMER

The information presented herein is presented in good faith and believed to be accurate as of the effective date of this Material Safety Data Sheet. Employers may use this MSDS to supplement other information gathered by them in their efforts to assure the health and safety of their employees and the proper use of the product. This summary of the relevant data reflects professional judgment; employers should note that information perceived to be less relevant has not been included in this MSDS. Therefore, given the summary nature of this document, Keystone Industries does not extend any warranty (expressed or implied), assume any responsibility, or make any representation regarding the completeness of this information or its suitability for the purposes envisioned by the user.